CHEMICAL INDUSTRIES

VOLUME XXXV NUMBER 1

The Real Revolution

PROFESSIONAL statisticians and economists pay scant attention to the chemical industries. We are hardened to this neglect, which indeed has certain compensations; but two recent books—solid, serious works by good men—display an ignorance of the rôle of chemicals in our industries that is a disgrace to the authors and a reproach to the industries.

In his 942 page "Economic History of the People of the United States," Fred. A. Shannon writes two paragraphs on chemicals in which he manages to condense the amazing misinformation that the Chemical Foundation was "created for high-brow propaganda," that in 1914 Germany was the "leader of the world in chemical production," that lacquers are made from coal-tar. These are understandable slips; but that the fastest growing industry in America and the fifth largest producer of our national industrial wealth should be so slighted and so misunderstood, passes comprehension.

In his "America's Capacity to Produce," Edwin G. Nourse devotes nine of 368 pages to a discussion of chemicals (chiefly explosives and chlorine); but says nothing about sulphuric acid, coal-tar, cellulose, nitrates, potash, phosphates, naval stores, or alcohol. Here is a mass of carefully annotated facts which misses the basic fact that in the past two decades chemical synthetic materials and chemical processes have come to control the entire productive capacity—industrial and agricultural—of every nation in the world.

These books are historical and statistical editions of Hamlet omitting the Prince of Denmark from the cast. The resulting performance is a sorry one. No economic consideration can afford today to so ignore the plain fact that new materials of chemical origin and the employment of chemical for mechanical energy are profoundly changing the tempo and the technique of material progress. Nor is this the first chemical revolution. The people who discovered bronze drove the flint-chipping cavemen out of Europe. Gunpowder blasted feudalism to bits. Who dare foretell what the new qualities of synthetic materials and the untold energy of the atoms will accomplish through the instrumentality of chemical industry?

Rights and Contracts

Unsatisfactory conditions surrounding contractual relations have for a number of years periodically forced themselves upon the attention of the chemical industries. Protection against decline in sales contracts and the patent rights in chemists' employment contracts have long been sore points; but far more serious has been the gradual weakening of the whole contract structure not so much by specific exemptions and particular exceptions as by an open disregard of pledged obligations.

This free-and-easy spirit was born during the hurly-burly of the war. It has grown greatly during the strain of the depression. That the Government could repudiate its gold obligations without raising a roar of protest is a sorry commentary upon our disrespect for the nation's given word, and it certainly does not improve our national sense of honor to know that the majority of our citizens felt that this arbitrary cancellation of solemn legal pledges was to their personal advantage. That's the rub—the bazaar philosophy that whatever is profitable is right, formerly held in contempt, is too often and too openly condoned.

The Government has been nurturing this laxity. Unfortunately it has so long set a bad example by taking advantage of its immunity to court action in cancelling contracts that firms who have done much federal business, and there are many such in the chemical industries, have come to regard Government contracts as extremely dubious business. But recently legislation, which has avowedly very different motives, but which actually will kill the last shreds of confidence we have left in contractual relations, has been introduced Congress is assuming to itself the right to cancel contracts by law.

The new air mail law not only further punished the old carriers, but it also legalized the abrogation of whatever rights they may have had under their old contracts. The N. R. A. codes are full of all sorts of provisions for the cancellation of all sorts of contracts for all sorts of reasons. But the most flagrant case is the latest proposed farm mortgage relief, which makes it possible not only to defer payments against principal for five years and to cut down the interest rates to one per cent.; but even actually to reduce the mortgage obligation.

Like insurance the contract is one of the most important stabilizing devices of modern industry. It is a brake on the ups and downs of prices. It assures the buyer of raw materials or supplies of goods for resale while enabling the seller to plan ahead with confidence. It is the simplest, surest form of employment insurance. It is the very foundation of our credit system.

Hours of Work

It is a pity that the shorter working week has been involved in the N.R.A. program, for it is going to take a long time for us to dissociate it from work-sharing as a form of unemployment relief.

At the moment the worst argument for shorter hours is the favorite. They do not cure unemployment, in fact in the long run they tend to aggravate it by keeping men at work in over-produced fields and postponing the absorption of excess labor out of decaying industries. Even as a form of relief, it merely shifts the burden from the charitable and the taxpayer to the wage earners, or if there is no wage reduction, to the consumer in the form of higher prices resulting from higher costs.

Shorter hours are necessary if there is to be a real rise in our national standard of living. This is the real argument. But we should not forget that shorter hours are not made necessary by technological progress. Technological progress has made shorter hours possible. Increased output per worker per hour has made it feasible to shorten hours without lowering wages. A hundred years ago the average work-week was 76 hours; today it is 44. In 1834 real wages (wages divided by cost of living) stood on the index at 55; today it stands (despite the depression) at 128.

Wages like profits come out of production and the failure of N.R.A. to restore prosperity by transferring income from profit-earners to wage-earners is apt to be one of the economic fallacies of the New Deal most promptly disproved. Ultimately the workers themselves must decide how much income they wish to sacrifice for how much leisure. To date the trade unions have been more insistent on maintaining scales than shortening hours. This has always been true, and labor would undoubtedly be the strongest opponent of the compulsory 40 hour week, if wages were to be cut proportionately. Accordingly, adjustment of wages and hours had best be postponed till business volume, dollar values, and taxes are all upon a sounder, more stable foundation.

A Chemical Tourist through the South: III

Pink Potash and Carbon Black

By Williams Haynes

Out in the Southwest they boast that you can look further and see less; that there are more cows and less milk, more rivers and less water than in any other part of the country. They are altogether too modest. They could quite safely add that they are the home of the most beautiful and the ugliest of all chemical operations in America.

A carbon black plant holds the latter honor undisputed. If you have seen one in operation even ten miles away (which is quite possible out on the plains of the Texas Panhandle) you will concede the claim. About two hours after you have completed a tour of such a plant, when you emerge from your seventh successive bath and reach determinedly for a second cake of Lifebuoy, you will admit no rival. Incidentally, you will also be everlastingly convinced that carbon black makers understate their sales arguments when they talk about "the smoothest, most penetrating, permanent, blackest black".

For the most beautiful chemical operation, I submit the new potash mines near Carlsbad, New Mexico. A thousand feet underground are series of vast fairy palaces, great square tunnels cut through what appears to be rose crystal quartz. It is really sylvinite—assaying 26 per cent. K_2O—but sparkling in the electric lights of the mines, the delusion of rose quartz is perfect and the effect enchanting. And the operation is clean! Not the least attraction is the atmosphere of the mine. In the shade, on the porch of the office above ground, the thermometer registered 96°—it was April 12, 1934—while down in the mine it was 74°, a temperature that varies but a degree or two all the year round.

Quite aside from these physical charms and esthetic values, I am not at all sure that these two American potash mines were not the most impressive sight of all our seven thousand mile tour of the new Southern chemical developments. No one who lived through the frantic days of the potash famine during the World War, when any sort of potash bearing material was worked with more vigor and optimism than chemical good sense, and when Jersey greensands and California kelp were both widely hailed as our everlasting potash salvation; no one who battered his way through that barrage of makeshifts and had seen them all vanish as soon as the Franco-German supplies were again available, could be anything but a bit skeptical of stories of American potash independence. Even the Bureau of Mines figures for 1933 production, showing an increase of 133 per cent. to 333,110 tons (143,378 tons K_2O) from 143,120 tons (61,990 tons K_2O) seemed too good to be true. After all Searles' Lake has been increasing its capacity and is even going in for soda ash this fall, so—well, we were just naturally dubious about the reality of the importance of the new Carlsbad mines.

But seeing is believing. There are two very real mines operating, and unless all signs fail they are both working big, rich veins. Whatever might befall to cut us off from French, German, Spanish, and Russian supplies we are not going to have another potash famine so long as those two mines are kept in working condition. It might be wise to cut down somewhat drastically the piles of cheap potash the Spaniards and the Russians have been dumping at our Eastern seaports in order to give these potash operations of ours, both from the lake at Trona and at Carlsbad from underground, a chance to set their commercial foundation. If merely the suggestion of an embargo on a fertilizer material is treason, we might compile the pretty total of subsidies that industry has been forced to pay to agriculture ever since President Hoover began pegging the wheat, corn, and cotton markets.

Figures on Potash Dumping

That this potash dumping is serious may be quite easily shown by the figures. Imports of potash salts increased from 330,964 tons in 1932 to 479,430 last year. Of this total roughly 30,000 tons came from Russia and 50,000 from Spain and were sold at cut prices. These imports have been showing an uncomfortable increase this year. Our American supplies are quite sufficient for our needs, and the potash content of our natural deposits quite high enough to enable American producers to compete with any honest European price. In plain words, if dumping is stopped and freight rates, taxes, and Government royalties are not increased, our new potash industries will prosper, and the American farmer will be able to buy at the same price mixed fertilizers of a higher potash content. These are very tangible accomplishments, not to be lightly thrown away.

Carlsbad, N. M., the center of these new mining operations is a unique city on the Pecos River, one of the few streams of the Southwest that makes any serious pretense of flowing most of the year. Thanks to the hobby of its eccentric founder, it is laid out with wide streets planted with trees that are almost a curiosity in the flat world of cactus and mesquite. Its business streets have a smart modernity and it is almost as proud of its homes as it is of its famous Cav-

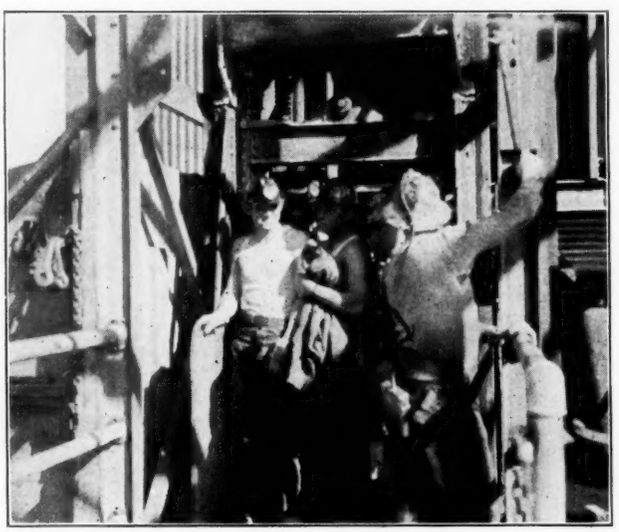
erns and its new potash mines. At Carlsbad was the first federal irrigation project, launched by Roosevelt —"the late lamented Roosevelt" as Carlsbadians distinguish him—and what with corn, cotton, and cattle this is a section of established prosperity. Potash is a boon, but not a boom.

The potash mines are some twenty miles northeast of the city, seven miles apart. We drove out to the older operation first, as seemed fitting, and coming suddenly over a rocky barren rise looked down on an astonishing and inspiring sight. On all sides as far as the eye could reach stretched the empty semi-desert through which we had driven all the previous day. You could hardly imagine yourself further from nowhere. Yet there, right in front of us, was a great gray group of modern plant buildings, dominated by the towering steel skeleton which is the hoist and head frame of the mine. It seemed a mirage, something unbelievable, yet something so substantial that it impressed you instantly and convincingly with the reality of our new potash industry. In the neat little office building we stripped off our coats, slung storage battery lights on our belts, and were fitted to helmets. Then down the mine shaft elevator to the underground fairyland.

The United States Potash Co., owned presumably on a 50-50 basis, by the Snowden-McSweeney oil interests and the Pacific Coast Borax Co., began mining sylvinite in 1931. This ore is potassium chloride mixed with sodium chloride. After crushing and sizing, part of the run-of-mine material is sold as "manure salts" and purified part to KCl (99½ per cent.) at their refinery 18 miles away at the Pecos River opposite the town of Loving. Their vein is 8 to 12 feet thick and runs on the average 43% KCl, 56% NaCl, and less than one per cent. of insoluble matter which is chiefly Fe_2O_3 and which gives the mineral its delicious pink color. They have sunk two shafts to a depth of a thousand feet, where between two layers of virtually pure rock salt they are mining the sylvinite by the undercutting and blasting operation familiar in coal mining. Two scraper loaders fill 3-ton mine cars at the rate of 240 cars per shift. Two 4-ton skips can hoist 150 tons to the surface per hour, a comfortable leeway over present crushing and refining capacities. The ore bin at the mine head has a capacity of 250 tons from which the crude salts are carried on a 24-inch rubber belt conveyor to crusher where it is ground to pass a 10-to-the-inch mesh and from the stock pile loaded for shipment over the company's own railway to the refinery at Loving.

Underground the mine is laid out on the compass points, rooms and galleries are 9 feet high, 40 feet and 20 feet wide respectively, with 40 foot blocks, and a 150-foot barrier each side of the four main entries. The plot calls for about 75 per cent. extraction. C. A. Pierce is General Superintendent of the mine, a mining engineer of long experience in the Southwest. The mine of the Potash Company of America is seven miles away. Here we found two sons of the President, C. M. and G. R. Harris, with R. C. Magraw, general superintendent, and R. A. Pierce, chief engineer, hard at work building up their stock pile against the fall sales. Their mine has one shaft and they are working out four ways in 8-foot entries, down 989 feet, with their ore sink at the foot of the shaft 1100 feet. Their shaft goes through 200 feet of salt to an 8 to 12-foot stratum of sylvinite resting on a bed of virtually pure rock salt of a maximum proved thickness of 3000 feet. Their building started February 12, 1933, and the first potash was brought to the surface March 1, 1934. Last May they were mining and crushing 100 tons a day and had set 300 tons daily by this August as their goal, which is half of the present crusher capacity. They are equipped with two diesel engines (400 and 600 h.p.) and are generating their own electricity. Their chief chemist, Dr. W. C. Graham, has been designing a refinery, and the plans are now on the drafting boards. Construction will begin this summer, and the schedule calls for operation the first of the year.

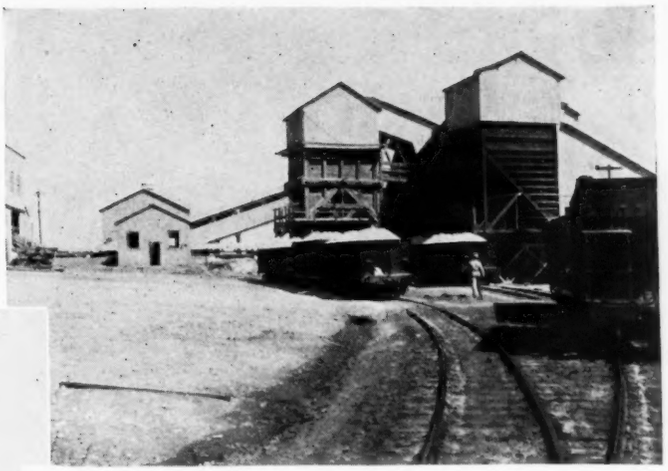
Refined potash is a rather important item in the program of this new industry, for the location puts



Potash miners, at the new Potash Company of America's mine near Carlsbad, going down in the mine elevator.

heavy emphasis upon freight rates. We were fortunate in visiting the U. S. refinery, escorted by T. M. Cramer, resident manager of the company's properties, who not only built it and operates it, but brought to this work twenty-four years' experience in refining work in our western states with the Pacific Coast Borax Co. He is a proud and jealous father. The operation is based on the physical fact that at 3,500 feet above sea level a saturated solution of sylvinite boils at 227° F. while at 70° F. some 16 lbs. out of the 60 lbs. KCl dissolved in 100 lbs. of water will crystallize out. If this mother liquor is again saturated with sylvinite, it will take up another 16 lbs. of potash salt, but being already saturated with NaCl will leave a residue of common salt. The U. S. Potash Company's operation at Loving is carried on largely by gravity from the third floor where the crushed crude

Right, grinders and filling bins at the U. S. Potash mine, and below, the Potash Company of America, showing mine head, covered conveyors, and grinders.



sylvinite is steam heated, mixed with mother liquor in batches, the salt removed from the saturated solution, the hot solution run down to Swenson vacuum crystallizers. Here the heat in the liquid supplies latent heat of evaporation and cooling. The KCl removed in this series is filtered and dried, weighed and then conveyed to the storage bins.

The capacity is 200 tons of KCl a day; but they have torn away the end of the main refinery building and were doubling its size. Mr. Cramer was obviously proud of these expansions too, but he was not saying very much about them. Indeed he was so "devilishly uncommunicative" that, being such a frank and friendly man, one could not escape the suspicion that the larger plant meant other things than more refining capacity—other potash salts?

That evening we had dinner with Mr. and Mrs. Cramer and afterwards, out in the moonlit patio garden of their delightful home, we learned at first hand the romantic story of the southwestern potash beds. Many geologic ages ago, the central portion of this continent was covered with a great shallow body of salt water reaching from Nebraska to New Mexico. It has been called the Permian Sea after a similar formation discovered first at Perm, Russia, and which is now the source of the recently exploited Russian potash. It is believed that the potash deposits in Germany, France and Spain all had similar origins. The various salts were deposited by evaporation in the Permian Basin, and similar physical facts upon which Mr. Cramer's refinery operations are based caused the potash to be deposited in layers.

Remembering those 3000 feet of rock salt, with 8 to 14 feet of sylvinite, topped by 200 feet of more rock salt, I asked a geologist in Nashville, with whom we were later discussing the potash development, if he had any idea what quantities of sea water and what number of years were involved in laying down these vast deposits.

"Of course," he answered, "we don't know what the temperature and other climatic conditions were, or whether the salts came solely from leaching of the land or were supplemented by wash from the ocean over the low banks; but as I remember it the lowest estimate is something in the neighborhood of 5,000,000 years."

Just twenty-four years ago—by way of violent contrast—potash was discovered in the New Mexico-Texas Permian salt basin, in the borings of an oil well at Spur, Texas, by J. A. Udden, of the University of Texas. Three years later the Geological Survey and the University of Texas drilled to over 1700 feet at Cliffside, near Amarillo, and private prospectors missed by but a few miles the beds near Carlsbad. These were actually discovered in 1925 in a dry hole drilled by the Snowden-McSweeney Oil Co., on a prospecting permit issued to H. V. McNutt, a geologist of San Antonio. The next year Congress voted half a million for potash exploration by the Geological Survey, and the Snowden-McSweeney interests under a potash prospecting permit in the name of the American Potash Company began systematically to explore the region northeast of Carlsbad.

As a result of these test drillings it has been established that the potash bearing area of the Permian basin comprises some 40,000 square miles. In the most promising section of 100 square miles, 33 square miles have been proved to contain beds of sylvinite, 4 feet or more thick, 14 per cent. or better K_2O. The proved up area in the ergion contains reserves of 100,000,000 tons, a quarter of which run 28 per cent. material, or twice the richness of the German deposits. Almost all of this land is Government owned, and is leased under the Federal Potash Leasing Act of 1917. The United States Potash Company has leases for 15,000

acres and the Potash Company of America controls a slightly smaller area.

American crude potash compares rather better than favorably with foreign supplies. The sylvinite at Carlsbad runs better than 25 per cent. K_2O. The crude salts of foreign competitors run as follows: France, 16-18%; Germany, 14; Poland, 14; Spain, 10. Russian sylvinite is being sold as manure salts (15%); or concentrated (62% and 52%), and due to their long freight haul we may assume that crudes are no higher than the lowest figure which indeed may well represent some grading with refined or selected material. Our producers therefore start with a better raw material and in most cases can handle half the crude to produce equally concentrated salts. Accordingly, the tendency to ship from Europe more and more concentrated material will continue. Since 1921 Germany has gradually cut down shipments of kainite (12-14%) and since 1929 of manure salts (20-30%) as evidenced by the rise in the average grade of all potash salts imported from 27 per cent. pre-war to slightly over 40 per cent. today. With an inland plus ocean freight averaging for France and Germany about $4.50 against $6.50 from Carlsbad to Mississippi or Gulfport, it is plain that, despite richer materials and lower production and refinery costs, our producers are naturally stimulated to increase refinery capacity. Comparative costs on the most strictly comparable material, French sylvinite (20%) have been estimated by the Bureau of Mines (*Bull.* 274) at $2.40 a ton, while Ward estimates (*Chem. & Met. Eng.* 40, 4, p. 176) that the Carlsbad mines can produce at $1.75 a ton, allowing 95c for the heavy development expenses. Barring dumping, we are in a strongly competitive position.

From Carlsbad we drove across the Panhandle cattle ranges and oil fields to Amarillo where a Committee of the Texas Legislature was just concluding a hearing on the waste of gas. An extremely complicated and difficult problem has created the appalling situation that 200 million feet of gas are escaping, after stripping to get out the gasoline, every day in west Texas. The root of the evil lies in the fact that, since the land surface is laid off in square quarter sections, a well driven in the corner forces the owners of three adjoining claims immediately to drill off-sets. Added to this, nobody, with the notable exception of the University of Texas, which owns considerable gas and oil rights, is interested in posterity, and most conservation measures run right across the grain of self interest. To expect that a Texas landholder with a comfortable fortune in royalties dangling in front of his nose will stick to ploughing land and branding cattle is just as ridiculous as to suppose that an oil corporation will let profits slip away in order that its stockholders' grandchildren may enjoy some extra dividends.

In fact, the best conservationists in the Panhandle are the carbon black companies. They at least are glad to use as much of the stripped gas as possible to provide the world's markets with carbon black. Of course, they are quite willing to buy at the price of a waste material, and even they consume it in a process that has often been bitterly criticized as being itself woefully wasteful. Let's give them their due, for even if they are only utilizing a small fraction of the carbon in the gas they burn, they are at least the best and biggest check upon the dissipation of gas.

While Amarillo is the commercial center of the Panhandle gas fields, the producing points are at smaller surrounding towns, Borger and Pampa. Like the cloud of smoke that guided the Israelites through the Wilderness (and for the identical reason) you can see a carbon black factory afar—as far as ten miles—so naturally they do not attract neighbors. It was at Pampa that we dressed in borrowed finery, and under the chaperonage of C. L. Wooley and E. H. Damon—two good transplanted New Englanders, who are enthusiastically naturalized on the high rolling plains where a few cottonwoods replace their native elms and there are ten thousand jack rabbits for every Yankee woodchuck—we set off to inspect the Cabot plant.

A carbon black plant is a comparatively simple oper-

An underneath view of the burners, plates and scrapers in a carbon black burning unit. Below and left, birdseye view of the Panhandle Carbon Company, at Borger, Texas.

ation. Long, low sheds of sheet metal construction are erected, row after row in two sections. Just under the apex of the roof is a row of burners, over which passes a moving plate, back and forth, close over the flame, collecting the carbon black on exactly the same scheme that it will be deposited on a plate passed over a candle flame or on the chimney of a smoky kerosene lamp. The soot from this incomplete combustion, *i.e.*, carbon black, is collected by mechanical scrapers and by conveyors brought to the packing department. The heat generated by the operation, when added to the natural temperature of sunny Texan noontide, is tremendous.

While the actual producing operation is simplicity itself, all but automatic, and not from a chemical point of view remarkably efficient, nevertheless the collection, packing, and shipping of the material is carried on in the most modern manner. The exceptional efficiency of these departments makes one feel that the burning process, for all its crudities, is undoubtedly the most economical one to be found, for the handling and packing problems of this industry are not at all simple.

The material is physically very like flour, light, fluffy, sticky, hence difficult to handle and very bulky for its weight, since it contains a great amount of entrained air. It is interesting to see how the industry has striven to conquer these difficulties. Formerly carbon black was tamped down in wooden barrels by a plunger covered with sheepskin, the wool allowing the air to escape without blowing out the black. Later, stirring in large tanks was used to remove air. The progress resulted in increasing weight-for-bulk as represented by 25 pounds for the barrel to the standard 12½ pound quarter barrel paper bag. Later came the practice of compressing the sacks.

New Carbon Black Product

Quite recently, a further improvement has been commercially perfected, and we found in operation in this Cabot plant the only industrial production of their patented product "Spheron". By this process carbon black is transformed from flour into finely granulated sugar. The physical advantages of the compact, free flowing form of minute pellets, are very obvious; but you will hear all sorts of different opinions among

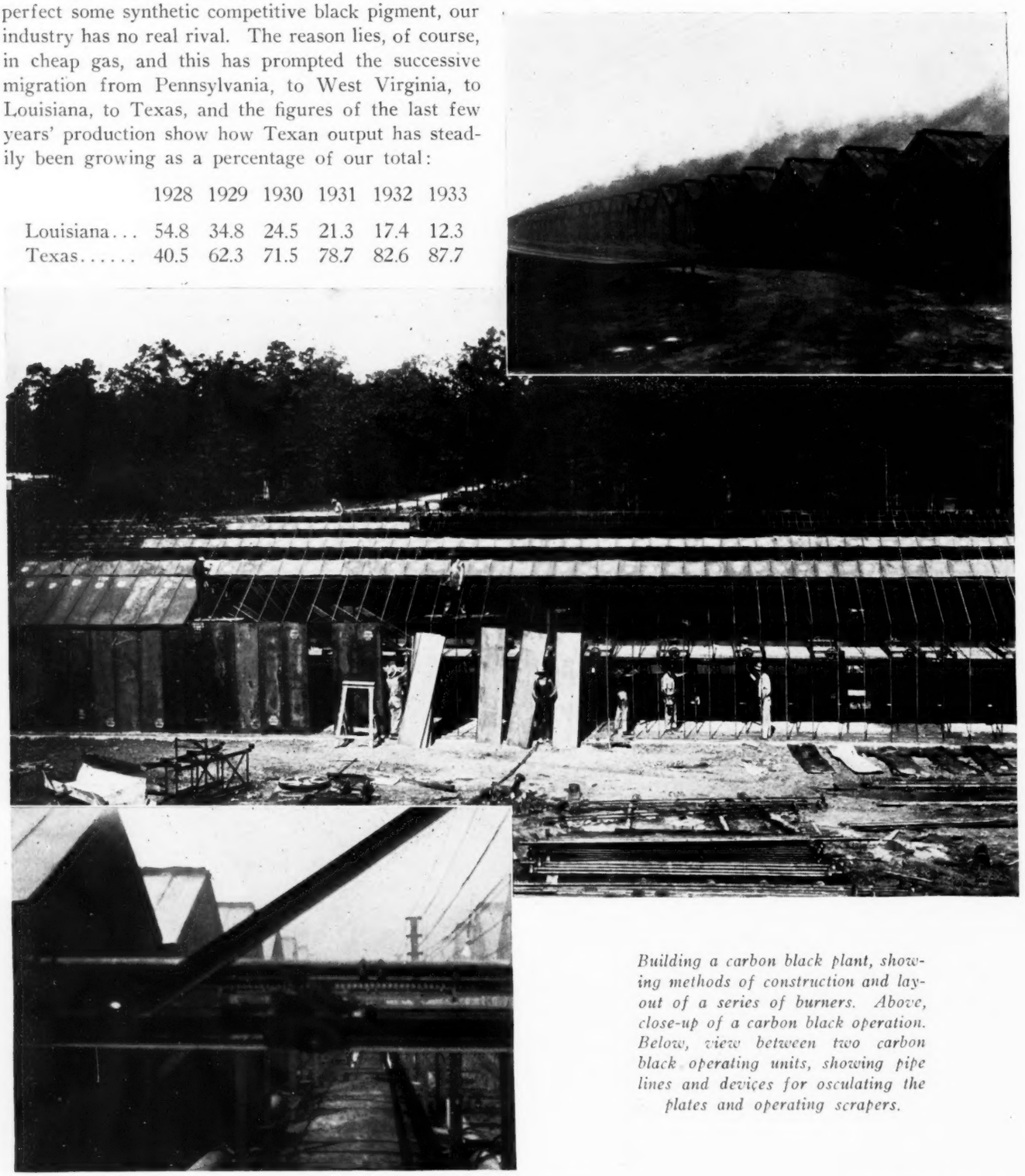
carbon black men as to just where this patented material will, or will not, prove most acceptable in fields of consumption where the extremely finely divided, flocculent characteristics of carbon black have for so long been among its chief claims to fame.

Carbon black, like sulfur, phosphate rock, and turpentine, is a chemical raw material of our southern states in which we hold a commanding world position. In carbon black our position is all but monopolistic, for although several other countries have supplies of natural gas and many foreign chemists have striven to perfect some synthetic competitive black pigment, our industry has no real rival. The reason lies, of course, in cheap gas, and this has prompted the successive migration from Pennsylvania, to West Virginia, to Louisiana, to Texas, and the figures of the last few years' production show how Texan output has steadily been growing as a percentage of our total:

	1928	1929	1930	1931	1932	1933
Louisiana...	54.8	34.8	24.5	21.3	17.4	12.3
Texas.....	40.5	62.3	71.5	78.7	82.6	87.7

In the midst of the depression, having become American headquarters for both carbon black and potash, the southwestern states have written themselves in a pretty big way on our chemical map.

Mr. Haynes' account of his inspection trip through our recent southern chemical developments will be concluded in our August issue with the story of "Chemicals from Brine" in the Ozark and Texaco plants.



Building a carbon black plant, showing methods of construction and lay-out of a series of burners. Above, close-up of a carbon black operation. Below, view between two carbon black operating units, showing pipe lines and devices for osculating the plates and operating scrapers.

An Open Letter from Francis P. Garvan to

The Brain Trust

A blistering indictment of the theories of internationalism and the practices of bureaucratic control over industries

To Mordecai Ezekiel,
Economic Advisor to the Secretary of Agriculture:

Your letter of June 7th, 1934, is as unsatisfactory as your former one. You are still the exponent of the movement for birth control of new American industries.

You state: "That does not mean, however, that the Department is not disposed to do everything it can to encourage the development of new industries *wherever those industries are well adapted to our resources and can stand on their own feet.*" May I assume to add "in the judgment of Mordecai Ezekiel, et al?"

In other words, you insist that American new industries, to meet your approval and cooperation, must spring, like Pallas-Athene from the head of Zeus, full armed and with a shout of victory. But, my dear Ezekiel, that is not the way practical men have built the industries of this country. Sweat and failure, strain and loss, have been the *sine qua non* of each and every one of the great new industries which have come to bless us. Had your predecessors in office been motivated by your principles of industrial birth control or industrial infanticide, American civilization would at least be something quite different from what it is now.

In your former letter you did, speaking for the Department of Agriculture, turn thumbs down on the efforts being made to develop the paper industry of the South and therefore the press reports are accurate.

Further you state: "In my previous letter I took issue with your statement that all the money spent on imported pulp wood was so much waste." I made no such statement.

I did state: "During the last four years the imports of wood paper and paper base stocks into the United States have amounted to an average of over 170 million dollars a year. This amount is roughly 70% of our yearly consumption. This amount goes abroad and is lost each year and what we get for it is used and goes down the sewer. This 170 million a year, if spent here, would revolve and be spent ten times. So 1 billion 700 million dollars worth of business in this country is lost to our economy each year." Which is quite a different proposition and points out your essential lack of understanding of international trade. You do not seem to understand that $1.00 of domestic trade is more valuable to our national economy than $5.00 of international trade. Do you not understand the theory of the revolving dollar?

There is an entity—call it American civilization, American standard of living, American business, jobs, the going machine of American life, American production and consumption, or what you will—whatever you may call it, it is the result of the development of America since the day Columbus landed on our shores. It is the result of the sweat and battle and sacrifice and genius of our forefathers. It is our inheritance and we are entrusted with it for the benefit of our children and our children's children. Each generation has left it to its succeeding generation more virile and self-contained than it received it. It is not only a business development, but it is warped and wefted with our liberties and freedoms. You cannot just cut out of it a segment and label it the machine lace industry of Rhode Island, the wool industry of the West, the dye industry, the medicinal industry, for example, and say we will trade this segment of that entity for this year's fortuitous surplus of an agricultural product.

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Take this very example of paper. We are endeavoring to start production of newsprint made from the slash pine of the South, thus diminishing unemployment, utilizing idle lands, solving the over-production of cotton problem, realizing a profit from the Government's reforestation project, and providing an outlet for the power developed by the Tennessee Valley Authority. This production promises continuous domestic supply and definitely reduced prices, without tariff, bonus or artificial aids.

We consume 50% of the world's wood pulp. Imports averaged over 170 millions yearly for the past four

years, or 70% of our consumption. The present 30% domestic production is dying in competition with imports. *Tomorrow 100% of our consumption will be necessarily imported from Canada, Sweden, Norway and Germany. Day after tomorrow these four countries will form a cartel and dictate to us, to our school book publishers, to all users, our price of white paper, and will thus control their margin of profit. What will then become of our boasted freedom of the press, on which all our other liberties depend?* Will you have truly represented the interests of the American people if you trade this industry for the surplus hogs or surplus wheat, as your first letter insisted? What economic professor can figure out that trade? The price of paper is fixed now in the British Empire. Are you willing to rest our liberties under such control?

Do you begin to understand the sanctity to a patriot of the entity we call our American civilization?

You state in your latest letter that "only through imports can foreign customers for Southern cotton get the funds to pay for it." Is that true? How do you know it? Is there no wealth in the world to pay for cotton except imports into this country? Is that the limit of your economic planning for taking care of our cotton surplus? Did you ever realize the possibility of transferring the Lancastershire mills to the South, or must you trade our cotton at their price for Scotch whiskey at their price? At six cents are you not exporting Southern soil? What about the new paper crop? What about alcohol in gasoline now aiding agriculture in twenty-one other countries? Have you ever asked the aid of science?

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Your theory is foreign propaganda, invented to justify the repudiation of debt and to lay the foundation for a raid on our American markets. It derives from the mind of a gentle economic professor, remote from active life, who stated it only as a theoretical bookkeeping proposition. But he was cautious even then and he added the qualifying words "in the long run," "eventually," "when you finally close the books in the sense that we say parallel lines must meet at infinity." But you professors now leave out these qualifying words, as do the defaulting debtors, and the Foreign Policy Association, whose name is a confession.

The gentle economist also only applied his theory to income accounts, careful to distinguish it in its operation from international relations influenced by international capital transactions such as loans, flight of capital, and so forth. He was also careful to state that the effect of this theoretical rule could be destroyed by the expenditure of tourists, remittances of immigrants, losses or gains from foreign insurance, short term transactions, and so forth. He was careful to point out it was only a theoretical bookkeeping rule and no proper basis for a definitive policy of international trade. That here again God, as so often in the past, could step in and war and pestilence and drought and disaster and invention and progress of science rob the rule of any virtue as a guide to the serious statesman.

What he was really trying to say was that our international books must balance, as must the books of any business, but "seeing as how" the United States Government keeps no books, and as how the average American's (including the economists') study of arithmetic stops at the age of twelve, you all were putty for the propaganda of dishonesty in the mouths of the welching foreigners and their accessories here—our international bankers.

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I have recently returned from Cuba, where 75% of the people are starving, as a result of the adoption by that country of the Ezekiel theory and its failure to adopt the theory of self-containedness up to the point of God's limitations. Under the gentle guidance of our international bankers, Cuba came to depend on foreign trade for over 60% of her income. The price of sugar fell and her people must starve or become mendicants. The same is true of Chile. They were taught to depend on nitrates and copper. Their people were taken off the fertile lands of the South and moved up to the arid deserts of the North and the discovery of synthetic nitrogen and new copper deposits in Africa has destroyed them.

Has the peasant of Chile reaped anything more than slavery? Have our people benefited? The international bankers sold to our people over 90 million dollars at about par in bonds of the Lautaro and Anglo Chilean Nitrate Co. These bonds sank to 25 cents per $100 in the summer of 1932. They are now in default and in the reorganization under the Chilean Government have been eliminated, and nitrate is now being dumped in this country regardless of any obligation to our bonds or our debts.

Cui bono? Who has benefited from all this internationalism? The poor Cuban or the poor Chilean or the American saver or the American consuming public? Sugar sold for 30c a pound in 1920. Nitrates sold for $90 a ton in 1917. Rubber sold for as high as $1.20 a pound in 1925, in which year we paid about 860 million dollars for our consumption of rubber. How much of it went to the poor Malaysian, the poor Cuban or Chilean?

Will you barter hogs with Chileans for the American nitrate industry, so essential to our national defense and our national agriculture?

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When the World War came, we found that we had neglected to live up to the determinations of our forefathers to be self-contained. As the world changed we had neglected science, and President Wilson sadly realized the dependent position into which we had drifted. But he did not say "Germany is better equipped mentally to make our dyes and drugs and nitrates and potash and camphor and iodine and rubber and so forth and so on, and after the war we will

acknowledge our inferiority and leave Germany master of the Master Science, Chemistry, and in that treaty we will trade our hogs for scientific progress and independence and national defense and national health and industrial progress and the character of our people." Sweetly trusting Kaisers and Hitlers!

No. He said: "God has given you the natural resources and has endowed you with the necessary mentality. America has borne you with a heritage of courage and determination and fearlessness. I do not expect your chemical industry to be a Pallas-Athene, but by embargoes and tariffs and encouragement I will see to it that American genius has a fair field and I will insist on your scientific progress toward the goal of American independence and self-containedness. My administration will insist upon your progress, that you may grow adequate to defend us in war and peace, adequate to administer the benefits of science to all our other industries, adequate in so far as it is God's will to free us from the weights of disease."

Today we have 25,000 chemists, the equal of any in the world. The chemical business is the largest business in the country, ministering to every other business, and we are sweeping on. And you seek to make a treaty with Hitler to take our surplus agricultural products in return for allowing him to implant a cancer in this development.

What do you know about the possibilities of the pine paper industry in the South? Its basic principle is the utilization of the God-given solar energy and climatic conditions of the Southland, and God alone knows what the future holds from its development.

Industry's Bookshelf

Lasting Prosperity, by A. G. McGregor; Pitman Publishing Co., N. Y., 206 pp. $2.

Whoever is interested in a currency of staple buying power (and who isn't?) will find in this lucid and readable book an extremely simplified explanation of the causes and highly plausible proposal for the cure of depressions. We suspect the plan of this close-thinking engineer would work when wages were going up; but "hae vurra grave doots" as to the reverse process. His book does a good job in cleaning up a lot of economic trimmings and rubbish about the whys and wherefores of depressions.

Industrialized Russia, by Alcan Hirsch, Ph.D.; Chemical Catalog Co., N. Y., 309 p. $3.

Dr. Hirsch is a self-confessed enthusiast who has tried sincerely to report Russia's industrial progress realistically. The result is a book of exceptional interest to chemical men, for the author is admirably fitted to appraise the Russian chemical achievement and as the chief chemical consultant to the U.S.S.R. he obviously had exceptional opportunities to arrive at the facts.

Salt As A Factor In The Confederacy, by Ella Lonn, Ph.D., 324 p., address all inquiries to the author, Goucher College, Baltimore, Md. $3.00.

Lack of salt may not have been the prime reason for the collapse of the Confederacy but it certainly was a very contributing factor. This absorbing story of the desperate efforts of the South to obtain salt supplies is a valuable addition to the industrial history of the U. S. and will be found as interesting as 90% of the current novels.

Rayon and Synthetic Yarn Handbook, by Dr. E. W. K. Schwarz and Herbert R. Mauersberger, 420 p., published by Rayon Publishing Co., 303 5th ave., N. Y. City. $3.00, domestic; $4.00 foreign, plus postage.

Perfectly enormous expansion in the synthetic yarn industry in the past few years has created urgent need for a handy reference book on the technical and statistical side of the American rayon industry. This first attempt admirably fills this need.

Colour Science, by Wilhelm Ostwald; Part 1, 141 p.; Part 2, 173 p.: published by Winsor & Newton, 31 E. 17th st., N. Y. City.

Colour Science has been translated from the German by J. Scott Taylor. Part 1 deals with color theory and color standardization; Part 2 deals with the multitudinous applications of the science of color. The two books constitute an authoritative (the late Wilhelm Ostwald was one of the outstanding scientists, particularly on the subject of color) handbook for advanced students in schools, colleges, and the various arts, crafts, and industries depending upon the use of color.

Modern Cosmetics, by Francis Chilson, 396 p., published by The Drug and Cosmetic Industry, 101 W. 31st St., N. Y. City. $6.00.

Most striking feature of this greatly needed volume is its extreme practicability. It is not a chemical treatise on cosmetics—it makes no pretense of being that, but it does give for the first time to the cosmetic manufacturer formulation, production and an authoritative discussion of packaging methods and equipment. For several years now its author has conducted a monthly production department in *Drug and Cosmetic Industry*. Some of the information in the book is taken from these contributions, but in the main, the material is new, original, and, heretofore, unpublished. To increase its usefulness a buyers' guide has been incorporated. Now that the gap has been closed it is difficult to imagine a cosmetic producer risking Mr. Chilson's book not being at all times within arm's reach.

The Breakdown of Money, by Christopher Hollis, 232 p., published by Sheed & Ward, 63 5th Ave., N. Y. City. $1.50.

This is not a text-book of economics nor generalizations for the social idealist: it is a handbook about the depression for the plain man, starting from his simplest questions, leading to common sense conclusions.

Introduction to Sales Management, by Harry R. Tosdal, 418 p., published by McGraw-Hill Book Co., 330 W. 42nd St., N. Y. City. $3.50.

This book combines elementary text material with selected problems which illustrate and furnish a basis for discussion of various phases of sales management. Its objective is that of furnishing to the student and instructor a basis for the logical study of sales management, to develop an approach to the problems of sales management and to teach students to think logically, using materials in the field of sales management.

Dartnell Sales Manager's Handbook. Edited by John Cameron Aspley, Chicago and New York: The Dartnell Corp., 932 p. $7.50.

This book provides sales executives with a compact, convenient handbook which includes not only current statistical data needed in managing sales, but also carefully selected experience on those phases of sales management of recurring interest.

International Chemical Industry Goes Nationalistic

C. C. Concannon Reviews the World's Fertilizer Supplies

THE fertilizer industry is notably international in sentiment, antecedents and set-up, due largely to the raw material situation and to the fact that plant foods are essential in the economic scheme of every nation. Though essentially international, and more so as the world has grown smaller, paradoxically the fertilizer industry becomes more strongly nationalistic because of its essential character in peace and in war.

Though fertilizer consumption fell in 1932 to a record low for recent years, recovery during 1933 placed the total volume of chemical plant foods applied to the world's arable land in excess of the average consumption for the 5-year period—1924-1928. Consumption of nitrogen showed a considerable gain, potash remaining about the same and phosphoric acid registering a decline. Our 1933 consumption of fertilizers has fallen much below the general average.

There seems to be no uniform, world-wide tendency in production and consumption. It is, likewise, impossible to generalize upon prices which show both advances and declines. Government interventions, artificial devices from the standpoint of unrestricted production and the free flow of commerce, are controlling factors of the first magnitude throughout the fertilizer world.

Because it naturally comes first to mind, let me discuss Germany, where the compulsory cartel law of July 15, 1933 empowered the Minister of National Economy to intervene in any branch of trade or industry, to compel the adherence of firms to existing cartels or cartels to be formed, or to cause the dissolution or modification of cartels, which was one of the outstanding events of the past year. An important case of intervention related to the potash industry, which had been cartelized for years. Its operation has been governed by the Potash Council, consisting of 30 elected members representing various national groups interested in potash. This Council was reorganized and the representation of agriculture increased at the expense of labor. Later in the year, the Council was abolished and its functions assumed by a bureau headed by an appointed official. Measures were also taken for prolonging production quotas held by the several producing groups, prohibiting the development of new mines, all this designed to stabilize potash over a long period of years.

Another outstanding case of increased trade cooperation was the strengthening of the Nitrogen Syndicate. The Government intervened and required a reduction of 7 per cent. in domestic prices of nitrogenous fertilizers fixed by the Syndicate, retroactive to July, 1933, and insured adherence to the Syndicate of outside producers. Ninety-eight per cent. of the total German output of nitrogen was controlled by the Syndicate, and producers were able to operate at around 35 per cent. of capacity under the quota restrictions of the Syndicate.

The new alignment involved the Government in definitely prohibiting the construction of new nitrogen plants. Another important feature was a revised method of profit calculation established by the Syndicate of advantage to member producers engaged in export. Much lower financial returns were secured from competitive foreign trade and much higher yields from the protected domestic market, an arrangement designed to improve the competitive position of German producers, as a group, against foreign producers. In practically all cases company reports so far seen almost invariably comment upon the beneficial effects of the new cartel relations.

Gains in superphosphate output recovered part of the heavy losses in 1931. Output increased 7 per cent., 46,000 metric tons, to 685,000 tons, from 639,000 in 1932 and a low of 509,000 in 1931. Despite these gains, the German industry has operated at less than half capacity and continues to leave much to be desired from a profit point of view. Gains were due primarily to drastic import restrictions. The increased activity brought much greater importations of phosphate rock, which rose almost 50 per cent.

Sales of nitrogen each month have been considerably above the level of the corresponding period of the preceding year. Results were gratifying to producers, inasmuch as the fertilizer year ended June 30, 1933, showed an increase of 26,000 metric tons to a total of 351,000 tons, from 325,000 tons in 1932. The upward trend continues through the early months of 1934. Financial returns to German exporters were un-

satisfactory owing to the marked price reductions made to hold the market in foreign countries.

The law creating the Chilean Nitrate and Iodine Sales Corporation (Jan. 8, 1934), fundamentally reorganized the Chilean nitrate industry. The Sales Corporation will acquire new nitrate from the producers at cost price plus $1.50 a ton, and old stocks at 3 pounds Sterling a metric ton. The cost price for new nitrate will not take into account interest on capital, amortization, and service on loans. Selling prices will be regulated by the market, without consideration of profit. The affiliated companies must produce nitrate even when it is not possible to meet debt service; and so guarantee the existence of the nitrate industry and place it in a position to compete in world markets. Profits, if any, will be divided, 25 per cent. to the Government in lieu of export taxes previously paid, and the balance, with certain exceptions, to the producers.

Situation in Chilean Nitrate

The Nitrate Sales Corporation officially began to function last January 29. Under the quotas for the next five years, independent producers received slightly less than five per cent., one-third of the balance to Cosach in Liquidation, and the remaining two-thirds to the Anglo-Chilean and Lautaro Nitrate Companies, 48 per cent. to the former and 52 per cent. to the latter. Increased activity in Chile nitrate is evidenced by exports. During the period July 1 to middle of May of the 1933-34 fertilizer year, these were 1,089,000 metric tons as against 986,000 tons in the corresponding period of 1932-33 and 903,000 tons in 1931-32.

Noteworthy correlated developments affecting the nitrate industry were the much increased exportation of sulphur and the considerable development of sodium sulphate manufacture. Sulphur was exported from Chile to South Atlantic ports of the United States, to San Francisco, and to Europe. In a new plant of the Anglo-Chilean Nitrate Company, output of sodium sulphate averaged 5,000 tons monthly last year.

Japan is not an outstanding factor in world fertilizer matters, but deserves consideration because of her determination to become self-sufficient in plant food production and to take a share of world fertilizer trade. The Japanese fertilizer industry profited from increased farm income, reflected in increased domestic production of the leading chemical fertilizers and a general advance in prices. Present farm prices are so low that fertilizer purchases must be reduced to a minimum, but the high productive capacity of the arable land in Japan has been made possible only by intensive cultivation, and there is a definite limit to which farmers may reduce their fertilizers. The average annual value of fertilizer produced in Japan proper during the 5-year period 1928-32 was 170 million yen and in 1933 was probably about 200 million yen. Ammonium sulfate increased from 685,000 to 714,000 tons and superphosphate from 1,038,000 to 1,128,000.

Effective control by the Sulphate of Ammonia Distribution Guild resulted in an average price of 94.13 yen per metric ton, an increase of 21.33 yen over the 1932 average. Cost of production in Japan is estimated at approximately 65 yen per ton or less, and producers were able to declare special dividends. Many plans for the further expansion of the sulfate industry are afoot, and the domestic industry expects to supply 810,000 tons in 1934, the rest to be imported from the European Nitrogen Syndicate under the terms of a recent agreement at the prevailing price of 93 yen a ton. Japanese producers have agreed not to export sulphate to July, 1934, and to limit exports to 50,000 metric tons during the last half of the year. They have also agreed to an export price of 140 yen a ton and to refrain from exporting to member countries of the international cartel. The estimated total potential production for the Japanese Empire late in 1935, when extensions are completed and new companies in operation, is 1,314,000 tons.

Japanese Competition

Sir Harry McGowan, Chairman of Imperial Chemical Industries, says in a recent article, "There has probably never been a trade phenomenon which has developed so rapidly as Japanese competition. Four years ago it was hardly showing above the Eastern horizon, but now it has covered practically all the markets of the world." What is to be expected from Japanese competition? The record shows that fertilizers bettered Japan's export position, and phosphate rock was an outstanding exception in a reduced schedule of imports. Other imports were nitrate of soda and potash, the 1932 total of 62 million yen increasing to 82 million yen in 1933. Exports more than doubled in value in the last two years (from 3 to 7 million yen) and almost doubled in tons. The increase was due largely to shipments to the United States of ammonium sulphate.

Capital investment as of December, 1932, in the Japanese chemical industry, including industrial, medicinal, dye, fertilizer, paint, soap, toiletries, matches and other non-enumerated branches of chemical classification, totaled 511 million yen embracing 1,451 companies. In this group were 173 fertilizer companies with paid-up capital of 230 million yen. Inspired by economic self-sufficiency and the will to build up a chemical industry free of foreign dependence and not losing sight of the profits feature, new companies were organized to manufacture important items for which Japan had depended on foreign countries, and the capacities of existing plants were extended to meet increasing demand. More new capital was invested in the chemical industry in 1933 than in any other industry, according to the figures published by the Bank of Japan. A total of

190 million yen in new chemical capital was invested in 1933 compared with a total of 368 million yen invested in all industries.

Russia now appears for the first time in the fertilizer picture. Development of a strong chemical industry was a fundamental of the first 5-year Plan and probably more actual progress has been made in the chemical phase than in any other direction in Russia's striving for self-sufficiency. Chemical plans are an important part of the second 5-year Plan and the development of fertilizer raw material resources and the manufacture of chemical plant foods is emphasized. In the Soviet Union the development of Khibiny apatite (phosphate rock) and Solikamsk potash are hailed as amazing victories of Soviet mining and chemistry. Though a former importer of small quantities of phosphate rock, Russia furnished almost 9 per cent. of the world total in 1933, ranking fourth in world production. The American fertilizer industry has been fortunate in recent years in that at least one of its essential raw materials, potash, has maintained in the interest of all consumers a steady price level. What the future holds in store so far as potash of Russian origin is concerned is a problem for which there is no answer at present.

The Spanish potash industry is interesting in its present development and in what may be its future position in the fertilizer world. In 1933 Spain assumed an important position in world potash trade, exports having increased to 197,000 tons from 66,000 tons in 1932 and 26,000 tons in 1931. From 1929 to 1932 the United States was the chief foreign buyer of Spanish potash but in 1933 the Netherlands occupied first place with 42 per cent. of the total, followed by the United States with 25 per cent. and Japan with 7 per cent.

Fertilizer Developments Abroad

Let us mention in a more or less hit or miss fashion a few points of fertilizer interest scattered throughout the world. The Manchurian Chemical Industries Limited, organized in 1933, plans for completion of its plant for manufacture of 100,000 tons of ammonium sulphate in 1935. Potash was produced in small commercial amounts last year in Tunisia whence have been coming in recent years large shipments of phosphate rock. Fertilizer production was encouraged in Scotland; superphosphate output increased. In Italy, De Nordiscke Fabriker of Oslo, Norway, is constructing a large electrolytic hydrogen plant for the manufacture of synthetic ammonia. In Czecho Slovakia, there is a new superphosphate cartel, Fosfa Limited, all producers being represented in the new organization. In Norway, production of electro-chemicals consisting primarily of nitrogen carriers, dominantly fertilizer bases, amounted to 10½ million dollars last year. Increased amounts of fertilizers entered Finland, Esthonia, Latvia, Denmark and Sweden during 1933.

These references to countries and commodities might be carried on almost indefinitely but are sufficient to show the diversity, complexity and relative importance of fertilizer matters in the affairs of the world. But the perennial topic of discussion is still the International Nitrogen Cartel. International nitrogen agreements at present effective expire shortly and European synthetic producers have been meeting in Switzerland with Chilean producers discussing sales agreements. What will result from these conversations is not a matter of concern to the United States only insofar as the consolidated nitrogen interests of the rest of the world may create a delicate or dangerous situation for our own domestic nitrogen industry, so essential to the safety and welfare of the Nation.

Bauxite Production, 1933

Shipments of bauxite from mines in the United States in 1933 were 154,176 long tons, valued at $923,259, an increase of 60 per cent. in quantity and of 68 per cent. in total value, as compared with 1932, according to information furnished by the U. S. Bureau of Mines.

Bauxite shipped from mines in the United States 1929-1933:

	Ala. & Ga.		*Ark.*		*Total*	
	*Tons**	*Value†*	*Tons**	*Value†*	*Tons**	*Value†*
'29	14,723	$84,480	351,054	$2,181,158	365,777	$2,265,638
'30	15,339	104,908	315,273	1,823,389	330,612	1,928,297
'31	9,198	59,179	186,697	1,081,450	195,895	1,140,629
'32	6,570	40,471	89,779	507,697	96,349	548,168
'33	11,997	69,541	142,179	853,718	154,176	923,259

† f.o.b. mines; * long tons.

In Alabama bauxite was shipped in 1933 from the Eufaula and "Lennig" mines, in Barbour County. The shipments (all for use in the chemical industry) were 67 per cent. more than in 1932.

In Arkansas bauxite was shipped in 1933 from four mines —the England and Dixie No. 2, in Pulaski County, and the Bauxite and Patricia No. 1 mines, in Saline County. Shipments of bauxite from Arkansas in 1933 were 142,179 long tons, an increase of 58 per cent. over 1932. The main production originated in the Saline County field, where there was an increase of 47 per cent. The mines in Pulaski County, however, shipped 76 per cent. more bauxite in 1933 than in 1932. Shipments from Arkansas were mainly for use in the chemical industry, followed in order by the aluminum and abrasive industries.

In Georgia bauxite was shipped in 1933 from the Hatton and "Easterlin" mines, in Sumter County. Shipments from Georgia in 1933 (all for use in the chemical industry) were 110 per cent. more than in 1932.

Domestic bauxite shipped by producers to industries in the United States, 1929-1933, in long tons:

	Aluminum	*Chemical*	*Abrasive*	*Cement and Refractory*	*Total*
'29	172,807	86,419	99,925	6,626	365,777
'30	179,869	67,690	82,116	937	330,612
'31	83,340	58,424	53,631	500	195,895
'32	28,899	61,838	5,612	.....	96,349
'33	46,506	89,226	18,444	.....	154,176

Bauxite imported into and exported from the United States, 1929-1933:

	General Imports		*Exports (including bauxite concentrates)*	
	*Tons**	*Value*	*Tons**	*Value*
'29	380,812	$1,753,840	133,551	$3,926,283
'30	415,058	2,800,372	104,504	3,776,774
'31	306,490	1,495,577	88,370	3,309,208
'32	205,620	1,042,829	28,474	1,162,238
'33	149,548	899,696	21,760	645,688

* Long tons.

Producers of domestic bauxite reported sales during 1933 at prices ranging from $4 to $11.50 a long ton. Average for Arkansas bauxite was $6 a ton, for Alabama and Georgia $5.80, and for the United States $5.99.

Fabric Cleaners and Spot Removers

By Cyril S. Kimball

Foster D. Snell, Inc.

SINCE some prehistoric ancestor dropped dinosaur soup on his bearskin, man has endeavored to clean a small area of his raiment without going to the trouble of cleaning the entire garment. A cloth with a little water on it is the most elementary method. For many types of stains, it is the most efficient. Other stains, such as grease, do not respond to that treatment. The next stage in the development is the use of soap and water, utilizing the soap for its usual emulsifying and dispersing properties. While moderately efficient there are also disadvantages. Herein lies the opportunity for which commercial spot removers are intended.

The removal of a stain from a fabric by a spot remover is often considered a simple problem. It is far from simple when the varied types of stains and the various types of fabric are considered. It is not unfair to say that, contrary to the claim of many manufacturers of such products, there is no universal spot remover. It is equally fair to say that if the nature of the spot is known, the majority of spots can be removed.

Classification of Stains

To simplify the problem of spot removal, stains should be considered as falling in one or more of the following classes: dyes, sugars, oils, fats, resins, albumins, and pigments. A stain from olive oil or from the lubricant of a car would be an oil stain. No distinction is made between oil and grease, because of their similar solubilities. It would be most satisfactorily removed with an organic solvent such as constitutes the base of the commercial fabric cleaners. A typical resin stain would be one of chewing gum; salad dressing would be a stain of oil and albumin. Such a stain of salad dressing would have the oil removed with an organic solvent and the albumin removed with cold water. Similarly, a berry stain would be one of a dye and of sugar and would normally be removed by hot water. A soot or calcimine stain would be a pigment stain and would either brush off or be removed with soap and water. The detailed methods of removal of stains is not our subject and the foregoing will, therefore, furnish an adequate illustration of these classifications.

Materials Used

Commercial spot removers normally consist of organic solvents. One type commonly used is the chlorinated organic solvents such as carbon tetrachloride, trichlorethylene, ethylene dichloride, propylene dichloride, and chloroform. These are very satisfactory solvents for oils and somewhat less satisfactory for many other types of stains, such as resins, etc.

The second class in common use consists of coal tar hydrocarbons, such as benzene, toluene, xylene, cumene, etc. They are good solvents but their use alone is limited by their inflammability. Blending with non-inflammable solvents, such as chlorinated organics, requires careful consideration of relative boiling points and relative molecular weight as related to speed of evaporation and possibly compound formation between the solvents mixed. They are, in general, better solvents for the majority of stains than the chlorinated solvents.

A third class available and used for this purpose are petroleum solvents. High grade gasoline is an illustrative example. Its sale is limited by the danger arising from its inflammability. A much greater gallonage of petroleum solvent consists of Stoddard Solvent under its many names, packed under many more names. This is a fairly good cleaner but the relatively larger sale of it is justified only by the relatively low price.

A fourth class of solvents, of only minor importance perhaps, are the volatile liquid alcohols and ethers such as ethyl ether and ethyl alcohol. In general this type is not used by the general public but rather restricted to special uses in dry cleaning establishments or factories where trained "spotters" are employed.

There is a mixture of solvent naphtha and acid soap commonly used by the dry cleaners under the name of dry cleaners soap. In a dilute form, this is frequently sold for home use. It is distinguishable from the usual type of fabric cleaner in having a cloudy rather than a clear and transparent appearance. The solvent properties of this type are the same as the basic solvent used but the soap aids in the emulsification and suspension of dirt particles.

One less important type consists of an inert powder spread on a spot to absorb grease after which it is brushed off.

There are somewhat more than sixty commercial solvents which might be used for this purpose. Of these, at least, 15 or 20 are being used commercially today. On an average a new solvent applicable to this purpose is developed in commercial quantities every six months. With this in mind, it is not surprising that improvement in the properties of fabric cleaners has occurred in the past few years and it is reasonable to predict that further improvements will occur.

Odor

There is no such thing as an odorless solvent for the purpose, except water. Therefore, every fabric cleaner offered has the problem of public objection to an unfamiliar odor. The manufacturer becomes accustomed to odor and thinks it is pleasant. The person who encounters it once every 30 days or at 6 month intervals may have quite different ideas.

From this, there develops the idea of covering up the supposedly unpleasant odor with a pleasant one. Unfortunately, unless the odors blend well, which is rare, the presence of a so-called cover odor only serves to make the original odor somewhat more unpleasant. The lot of the manufacturer would be much simpler if this were not the case. There are on the market a series of perfumed fabric cleaners but in no case does the perfume fully cover the fabric cleaner and, in practice, it often tends to make the ultimate odor worse rather than better.

Spots and Rings

There are many fabric cleaners offered on the market with the claim that they will not produce a ring. There can be no such thing. Let us assume that a man's suit came back from the dry cleaner's two months ago and has been worn daily. Regardless of his occupation, it is soiled. A simple stain, let us say of oil, occurs. That stain is efficiently removed by a good fabric cleaner. What results? There is a clean spot on a soiled garment.

Absorption by the fabric and capillarity cause the fluid to spread rapidly over a larger area than that to which it was applied. The fluid in spreading carries with it particles of dirt or components of the stain and on reaching the limit to which it spreads on the fabric because the fluid is all absorbed, leaves a residue in the form of a ring. The so-called ring is the dividing line between the soiled area and the area which has been cleaned. To some extent, this ring effect is minimized by shading the edge of the cleaned area into the soiled area. That, however, is not a property of the fabric cleaner itself, but rather a result of the art of the person using it and, however hazy, the ring is there. So it may be stated as fundamentally true that the use of a spot remover must inevitably leave some ring if the garment being cleaned is not clean as a whole.

Rate of Evaporation

Such fabric cleaners as ether and chloroform are used to a substantial extent by the "spotters" in the dry cleaners plants because of their very rapid evaporation. They are unsuitable for home use for several reasons. Aside from toxicity, which is really not important, they evaporate so rapidly that the user does not have time to properly manipulate them. Therefore, home fabric cleaners are customarily slower in evaporation than those used by "spotters". Frequently, some of the fabric cleaner evaporates only after a considerable number of hours and a garment such as a hat or a pair of gloves, which has been cleaned, gives the wearer a distinct aura of evidence that he or she has been using a fabric cleaner. This residual odor is minimized by having a solvent which leaves little or no material which is not evaporated after one hour. This cannot be arbitrarily measured, since the rate of evaporation will, to some extent, depend on the type of material to which it is being applied and the prevailing temperature and humidity.

This is relatively rare but there are such cases. It is fair to say that most commercial dyed fabrics are such that the dyestuff will not be removed by the usual commercial fabric cleaner. The ordinary loading applied to silks, such as tin, or more rarely lead, will not be removed. Occasionally, garments are treated or finished with oils or softening agents. A fabric cleaner should remove any oil no matter what its source and even if the oil were intentionally added, it is removed with equal readiness. Hence, this type of garment shows a distinctly lighter colored spot when it is cleaned with a fabric cleaner. A few types of commercial cleaners are such that they will dissolve cellulose acetate. Therefore, acetate silk, frequently spoken of under the trade name of Celanese or Acele is sensitive to those cleaners.

An improperly formulated fabric cleaner may be acid, and if so, the acidity may show an effect on the dyestuff. The defect here is one fundamentally in the cleaner itself.

Home Dry Cleaning

There is no dividing line between spot removing and home dry cleaning. Home dry cleaning should never be carried out with gasoline. A few years ago, it was estimated that there was an average of one death a day due to this practice. Many people will fill a pan with gasoline and immerse a silk dress in it. The mechanical friction then of swishing the dress up and down to clean it may create a sufficient static electricity to cause a spark which will ignite the vapors.

Safe home dry cleaners are available. A number of types of small machines with special solvent for use with them are on the market. The solvents so used are identical with commercial dry cleaners, differing only in the size of the package sold. Petroleum solvents, such as Stoddard Solvent, are frequently sold for this purpose and will not ignite from a static charge. The principle here involved is the same as that involved in their use by the commercial dry cleaner, who dares not use a material of lower flash. Many of us can recall the days before specifications for Stoddard Solvent were written, when it was the expected thing for a dry cleaning plant to catch fire once or twice a year.

Types of Containers

While frequently marketed in glass bottles, the use of tin containers is more common because of elimination of breakage. Their use requires that the product be so formulated that it will not develop acidity, while rare, corrosion of containers by fabric cleaners is not unknown.

Who Sells Them?

A fabric cleaner manufacturer will probably answer this question by saying everyone. The sale is through a great multitude of channels. They are to be found in every drug and department store, the two types of stores which traditionally sell everything from pins to automobiles, sometimes inclusive. Every garage and oil station is a merchandising outfit. Many grocery stores and practically all fixed price chain stores carry fabric cleaners. They are an item sold by the hardware store. They are sold directly to institutions and to large buildings for cleaning of upholstery and other maintenance use.

This diversity of outlets is not so surprising when we consider that annual sales exceed $4,000,000.

Proper Method of Use

It would be an oversight if the proper method of use of a fabric cleaner were not described. Relatively few who know how to use them correctly, apply them in that way. To outline this, we must go back to outline the problem itself. There is a spot on a dress. It is desirable to remove it. Merely smudging it so as to be less evident or dispersing it over a larger area does not constitute removal. Therefore, a pad of clean cloth should be put under the layer of the fabric on which the spot has occurred. Another piece of clean fabric should be moistened with the fabric cleaner. It should then be patted or rubbed on according to the nature of the stain until the stain has been completely dissolved by the liquid applied and not only has been dissolved, but has been absorbed in solution in the cleaner by the pad under the fabric. In that case, the spot can be correctly described as removed. Due to the fact that the spot may have been on a garment which is not itself entirely clean, it is then usual to rub in all directions with diminishing pressure away from the spot in order to remove the indications of difference in the degree of cleanliness where the spot has been.

Labor and Chemicals

By Dean Clark

Code Director, Chemical Alliance

FOR many years, many companies have taken the initiative by assisting in the development within the plant itself of plans for employee representation, not only for dealing with terms of employment but also leading to the solution of the many problems regarding which both Management and Employees have interests in common. Some of these plans have been outstandingly successful and in many ways, mutually beneficial.

Organized Labor, on the other hand, suddenly recognizing the opportunity afforded by the Recovery Act, took broad steps to expand and the old trade union classifications have been supplemented by new "vertical unions" intended to embrace all the employees of an establishment regardless of crafts. This new phase has naturally added considerably to union membership; but has also tended to conflicts within the ranks of labor as to jurisdiction, and has added much confusion to an already disturbed situation.

Some notes as to the legal aspects of the famous paragraph 7-A of the Recovery Act may be in order.

1—The language of paragraph 7-A is not intended to be a complete statement of all the rights and privileges of employees and employers. The intention and effect is to describe certain rights of employees, many of which have long been recognized by Management.

2—Employees are free to choose any method they desire of dealing with Management as to wages, hours and working conditions. Collective Bargaining is a right which they may exercise if they so elect, but the Section does not compel that form of dealing to the exclusion of other methods. They may deal through a trade union or through a plan of employee representation confined to the employees of a company, or they are free to handle their affairs individually if they so desire.

3—No contractual relationship may be entered into with one or more groups which will have the effect of depriving others of their right to bargain in their own way.

4—The obligation to bargain with employee representatives carries no obligation to accede to demands or to enter into any contract.

5—The law forbids requiring membership in a company union as a condition of employment but such organizations should not be confused with employee representation plans (erroneously called company unions) which do not have any such requirement, and where participation is on a purely voluntary basis.

6—Management has the right to know whether those purporting to be duly chosen representatives are such in fact, and whom they in fact represent.

7—The Section gives no right to third parties as such, but in forbidding coercion it does not forbid cooperation of the employer. The President contributed a valuable service when, in the automobile dispute, he said: "the Government makes it clear that it favors no particular union or particular form of employee organization or representation. The Government's only duty is to secure absolute and uninfluenced freedom of choice without coercion, restraint or intimidation from any source."

Conflicting opinion in Washington is indicated by the fact that the National Labor Board has maintained that employers must sign contracts with employees and also that representatives selected by the majority of employees in a given plant are the sole bargaining agency for that plant.

As to this, Mr. Teagle, Chairman of the Industrial Advisory Board, quotes General Johnson as follows: "It is the worker's choice as to whether he is to bargain individually or collectively through representation. If any employer should make a contract with a particular organization to employ only members of that organization, especially if that organization did not have 100% membership among its employees, that would in effect be a contract to interfere with his worker's freedom of choice of his representatives or with his right to bargain individually, and would amount to employee coercion on these matters, which is contrary to law."

The problem of Management already made difficult by severe restriction of production, is made more so by reason of the widening rift between employer and employee. Organized labor is granted additional power and advantage under pending Bills in Congress. These Bills are far too great in effect to be hastily enacted. To arrive at any sound basis in the common interests of all, an exhaustive study of all the many factors involved must be undertaken and handled competently and intelligently.

The type of legislation exemplified by the Unemployment Insurance Bill is another indication of a growing tendency on the part of a large portion of the people in every occupation to feel that the Government is an impersonal institution that owes them a solution of their difficulties and even a living, regardless of their own responsibility and initiative. Such legislation as the Labor Disputes Bill jeopardizes the peace and prosperity of the country through its attitude toward industry and tends toward stirring up strife between employer and employee; furthermore it contributes nothing constructive toward the development of cooperative effort in industry.

There is evidence of a deliberate attempt on the part of sentimentalists to accentuate and emphasize in the public mind a false impression that all employers treat employees unfairly. This type of legislation places all obligations upon the employers and none on the professional agitators, and would result in retarding efforts of

Speech delivered at the annual meeting of the Manufacturing Chemists' Ass'n held at Skytop, Pa.

Management to improve employee relations or would lead to Governmental control and determination. The National Labor Board, as it has attempted to function, tends to drive matters of complaint away from the point of their origin and from the place where they should be settled, and is thus disruptive of employment relations.

The period following a depression is usually marked by strikes and it appears that we are now entering such a period in which the disputes cover more than the question of wages. The most critical problems do not lie in wage scales. Continuity of employment is far more important to sustain the high standards of living in this country which have been attained by the constantly increasing capacity of American industry to produce more of the things the people desire.

The appalling magnitude of losses to employees alone caused by strikes is shown by the fact that during the last six months of 1933, there was a loss of over 11 million man-days due to industrial disputes. Assuming an 8-hour day, this would amount to over 88 million man-hours and taken at the December average hourly earnings of 51.2c reported for 15 industrial groups, this would mean a wage loss of over 45 million dollars. This amount is greater than the value of the total output of the automobile industry in some of the worst months of the depression.

Restoring Prosperity on a Sound Basis

How can it be expected that prosperity can be restored by further increase in wage rates and shorter hours in the face of the rejection by labor of such gross amounts in wages? The greatest assurance to the employee of good wages and proper working conditions is predicated upon the business of the employer being reasonably prosperous.

The chemical industry is outstanding in its important relations to other industries; in the spheres of health and national defense as referred to in Article IX of the Chemical Code. The very nature of its business and its manufacturing operations requires exacting and technical skill to insure quality and safety, and chemical plants and operations cannot be run from the outside.

The over-emphasis being given to the term "collective bargaining" and the accompanying "rights" of employees, all of which have been recognized and given effect long before the Recovery Act, has tended to obscure in the public mind the real fundamental responsibilities of Management.

The prime responsibility of Management is to maintain an equitable balance between labor, stockholder and consumer, and anything which tends to disrupt this equitable balance is wrong.

There has grown up in recent years a recognition by Management and employees of the desirability of cooperation, and a better conception of the interests of Labor and Management as being essentially mutual and not antagonistic.

Enlightened Management which has accepted this principle has found successful methods of employee representation under which employer and employe can agree, avoid conflict and unite to further their mutual interest in the welfare of the business.

This basis of proper employee representation rests upon the foundation of a community of interest within a business enterprise. Such representation plans are not anti-union and often Union members are to be found on Works Councils working harmoniously with non-union representatives. In such plants the experience with employee representation is that the employees are indifferent to efforts to organize them because unionism offers no advantages over what they already have.

A proper form of employee representation is essentially a part of good management for it is through such means, when rightly handled, that employers, as well as employees, will educate themselves to understand the problems and points of view of each other.

It is good business for the management and employee representatives to join in determining the essential facts as to their common problems, interpret them and develop a basis that can be agreed upon for procedure that will be understood and be mutually beneficial.

Employee representation has these definite aims:

1—To furnish facilities to adjust grievances and prevent injustice.

2—To serve as a means for Collective Bargaining on wages, hours and working conditions.

3—To provide for the exchange of information and opinion between Management and Employees.

4—To educate Employees and Management to understand the viewpoints and problems of each other.

5—To promote efficiency, economy and safety, and to strengthen morale.

Employee representation will not succeed if:

1—The employer attempts to rule with an "iron hand".

2—He is not willing to commit himself to pay at least the prevailing wages for similar work in the locality.

3—He is not prepared to yield on some questions that may arise.

4—He is not willing to deal frankly and openly with his employees.

5—He is not willing to let his employees select their own representatives and methods of Collective Bargaining.

Considerable light is shed upon the present methods under which Industry is dealing with employees by examining the results of a recent nation-wide survey made by the N. I. C. B. The study covered 2700 companies having over 2,000,000 employees and represents a broad cross-section of the country.

1—Dealing individually—43.8% of employees

2—Through employee representation—46.6% of employees

3—Through organized labor unions—9.6% of employees

All of our industrial, social, financial and governmental relations are in a condition of flux. In the midst of this turmoil and strife, accentuated by the type of legislation referred to, Management will have an even greater responsibility than heretofore to stand firm upon principles that long experience has proven sound, equitable and just to business and employees alike.

It may be of interest to note the experience in England with an attempt at Union domination which brought on the general strike of 1925 and was followed by the British Trade Disputes Act. Under this Act, England:

1—Defined by law and distinguished legal from illegal strikes.

2—Provided for the control of trade union funds.

3—Prevented expenditure of trade union funds in support of illegal strikes.

4—Gave the individual the right of recovery against trade union leaders who undertook by coercion to compel him to take part in an illegal strike.

5—Provided that in government service, no distinction should be made in the letting of public contracts between those who employed union labor and those who did not.

6—Invalidated contracts in which discrimination is permitted between members or non-members of labor unions in the execution of contracts.

The Act of 1927 introduced various limitations upon the right to strike, the chief being that:

1—Any individual engaging in a trade dispute is liable to criminal proceedings if, by breaking a contract of service, injury or danger or grave inconvenience to the community is likely to result.

2—A strike is illegal which has any object other than or in addition to the furtherance of a trade dispute within the trade or industry in which the strikers are engaged.

3—A strike is illegal if it is designed or calculated to coerce the Government either directly or because it would be reasonably likely to inflict hardship upon the Community.

The last two of these provisions would unquestionably make illegal a general strike and most sympathetic strikes, whatever their objects might be, and would also make illegal any strike the objects of which extended beyond hours, wages and other conditions of employment. The illegality would hold even though the workmen had terminated their contracts of service. Any trade union official or other person who declares, instigates, incites others to take part in, or otherwise acts in furtherance of an illegal strike or lockout is liable to criminal proceedings; the mere cessation of work is not, however, a criminal offense.

It is enlightening to observe that this Act passed in 1927 has withstood several years of a labor government and is still in force.

That Industry has made effort to provide work for its employees during the period of depression is evidenced by comparing the income produced and the income paid out by the broad industrial classification of "Manufacturing" taken from a report of the N.I.C.B.

"In 1929—		
Income Produced	$19,354 Million	
Labor Income Paid Out	14,984 Million	77.4%
In 1932—		
Income Produced	5,873 Million	
Labor Income Paid Out	6,961 Million	118.5%

In other words, in 1932 "Manufacturing" paid out to "Labor" $1,088 Million more, or 118.5% of what it took in as the proceeds of doing business. This shows the extent to which Industry was living on its capital. In fact, in four industrial groups the income produced in 1932 was not sufficient to meet wage and salary payments.

As to the relative position of the chemical industry in the matters of employment, payrolls and total man-hours, the following index figures are illuminating. Considering 1923 as par, the figures show the average of 1929, the month of March, 1933, considered as the low point of that year, and also of April, 1934:

	All Industries			Chemical Industry		
	Avr. 1929	March 1933	April 1934	Avr. 1929	March 1933	April 1934
Employment ..	101.0	55.9	84.1	114.1	93.9	129.8
Payrolls	109.1	37.1	67.3	120.0	59.3	95.8
Total Man-Hours	99.4	36.6	61.7	108.1	67.4	93.5

The above index figures are of particular interest because they show chemical industry substantially leads industry as a whole in the number of employees, payrolls and man-hours.

I believe that the principle of the community of interest centering around each plant is the foundation upon which can be built up a relationship between Management and Employees so strong and satisfactory to both that outside influences can offer nothing to compete with its mutual benefits. It is here, and not in some remote place, can best be found mutually satisfactory solutions of those problems as they arise of conditions of employment and the welfare of the employees. The majority of controversies arise from misunderstanding and it is the responsibility of Management to set the example and provide the opportunity for the frank interpretation of facts and exchange of opinion with employees which if properly handled will tend to remove suspicion and friction.

I believe that the best means so far devised for the development and protection of the interests of Management and Employees alike, is the Works Council made up of freely chosen representatives of the employees to meet with representatives of the Management for the consideration of affairs common to both. There is a latent capacity among employees both of ideas and effort that can be drawn upon if given the opportunity.

It is the responsibility of Management to provide the setting for the development of confidence between employees and itself, and if both exercise the qualities of patience, tolerance, judgment and good will, there is reason to expect a real community of interest of lasting benefit to all concerned.

Italy's Fruit Acid Industry Threatened

The lemon oil and citrate of lime industry of Italy is being seriously threatened by the prevailing low prices for these products, according to a report from Consul Bernard Gotlief, Messina, made public by the Chemical Division, Department of Commerce.

One thousand lemons costing approximately 68c are required to produce at present price levels oil and citrate valued at only $1.08. When cost of processing and distribution are added it is said that the prevailing market prices for such products permit a very small profit to the manufacturer.

Until recent years the United States was one of Italy's chief markets for lemon oil and citrate of lime. In 1920 imports of citric acid and citrate of lime were valued at $1,142,850 and $3,038,000, respectively. The bulk of these imports originated in Italy. Invoice values during that year were 87c per pound for the citric acid and 24c for the citrate of lime.

Since 1920 domestic production of these products from California lemons, but chiefly through synthesis by the fermentation process, expanded rapidly until in 1928 the United States had almost ceased to import these products, despite extremely low prices, and had become one of Italy's chief competitors in foreign markets. More than 6,000,000 pounds of citrate of lime valued at $464,000 were exported in 1932, chiefly to the United Kingdom. In 1931, domestic production of citric acid was valued at approximately $3,000,000.

Citric acid and other products of citrate of lime are used extensively in industry. Large quantities are used for medicinal purposes, including the manufacture of citrates, foods, soft drinks, and candy. Progress in this industry is a striking example of the chemist's ability to compete with nature.

Blending Rubber Compounds and Resins

Low melting point resins may be satisfactorily blended with rubber compounds on the mixing mill either by adding separately after the rubber is well broken down or by mixing them in with the other compounding ingredients. High melting point resins, on the other hand, should be added to the unmasticated crude rubber as soon as it starts sheeting on the front roll of the mill. By this procedure the rubber, which is relatively hard, tends to break up the resin particles and disperse them uniformly through the rubber. In some cases, it may be necessary to heat the mill rolls with steam to insure perfect dispersion. *From The Rubber Age.*

Developments in Fertilizer Technology

By C. H. Kunsman

Fertilizer Investigations, Bureau of Chemistry and Soils,
U. S. Department of Agriculture

A NEW nitrogen carrier, ammoniated peat, is prepared by treating peat with anhydrous ammonia at elevated temperatures and pressures. By varying the moisture content of the peat, the pressure and the temperature, products containing from 7 per cent. to 22 per cent. nitrogen were obtained. Although small amounts of nitrogen are fixed in this process at atmospheric pressure increased pressures up to 100 atmospheres are necessary to obtain the products containing the larger amounts of nitrogen.

Nitrogen in Water Soluble Form

The products obtained in this process are promising, containing a large amount of water soluble nitrogen immediately available to the plant, and some slowly available nitrogen. They are not, however, as satisfactory as we would like them to be since they apparently also contain considerable nitrogen which is so tightly fixed that it may not be available to the plant during the first year. Several experiment stations are carrying out vegetative pot tests on this porduct in order to ascertain its exact fertilizer value. The results obtained to date would indicate that the nitrogen in the ammoniated product is somewhat less available than that contained in cottonseed meal or dried blood. Collateral studies are being carried on with regard to the chemical constitution of the nitrogen compounds formed. It has been definitely determined that urea is one of the compounds formed in the reaction, constituting from 13 to 15 per cent. of the product.

When CO_2 is added to the ammonia-peat mixture an added amount of fixation takes place in the form of the synthesis of urea. In this way products containing 65 per cent. urea, or 38 per cent. nitrogen are formed. The physical properties of all of these mixtures makes them a very desirable ingredient in mixed fertilizers, and they should be considered from the points of view of nitrogen-carriers, fertilizer conditioners and as a partial substitute for organic ammoniates.

Until quite recently relatively little change has taken place in phosphates for fertilizers. Superphosphate prepared by the sulphuric acid batch process was and still is the main source of phosphoric acid. The electric and blast furnaces permit the production of phosphorus and concentrated phosphoric acid.

Fig. 1 shows the general set-up of a five-ton pilot plant blast furnace, operated by the Bureau of Chemistry and Soils, for the production of phosphorus. Phosphate rock, silica and coke are fed into the top of the furnace by means of a skip hoist. A hot blast of air is fed through a tuyere into the base of the furnace at a pressure of from three to five pounds. The two stoves, one of which is evident in the figure, are essential in preheating the air or hot blast. These stoves are alternately heated and in blast.

Relatively clean carbon monoxide from the furnace is burned in one of these brick-lined stoves, containing pebbles, until the temperature of the pebble bed is about 900° to 1000°C. Air is then forced into the stove where it is heated by coming in contact with the hot pebbles and then led through a tuyere into the base of the furnace. At about 1400°C. (2552°F.) phosphorus begins to vaporize and goes to the top of the furnace with carbon monoxide and a certain amount of dust from the furnace burden. These hot gases are then cooled to 50°C. and below, by means of water sprays and a series of pipes surrounded by tap water acting as heat interchangers. The phosphorus, together with the dust, is collected by the water scrubbers and Cottrell electrical precipitator. About once an hour the slag is withdrawn at the base of the furnace. The phosphorus can then be either distilled and collected as elementary phosphorus, or allowed to oxidize to P_2O_5 and collected as strong phosphoric acid. This strong phosphoric acid can now be used to treat phosphate rock for the production of double superphosphate, containing an average of about 45 per cent. P_2O_5.

$$\underset{\text{Phosphate rock}}{Ca_3(PO_4)_2} + \underset{\text{Phosphoric acid}}{4H_3PO_4} = \underset{\text{Double superphosphate}}{3Ca(H_2PO_4)_2}$$

Calcination of Phosphate Rock

Another development is the calcination of phosphate rock. When phosphate rock is heated in the presence of water vapor at 1400°C. for a short time (½ hour) in a laboratory tube type furnace, a product very low in fluorine and containing 30 to 35 per cent. available phosphoric acid is obtained. As shown in Fig. 2 no increase in the citrate solubility of the phosphate occurs until more than about 60 per cent. of the total fluorine is volatilized. Furthermore, the data obtained show that no significant increase in solubility occurs until all the fluorine in excess of that corresponding to one atom of fluorine in the fluorapatite ($Ca_{10}F_2(PO_4)_6$) equivalent of the total phosphoric acid is volatilized; from that point, however, the increase in citrate solubility is more or less directly proportional to the percentage of the remaining fluorine volatilized. The presence of both silica and water vapor is essential to the removal of fluorine and the formation of citrate-soluble phosphate; the available evidence indicates, however, that

Address delivered before the annual meeting of the National Fertilizer Ass'n at White Sulphur Springs, Va.

the commercial grades and varieties of domestic phosphate rock usually contain sufficient silica for the reaction.

The present information indicates that the process can be carried out in rotary kilns with practices and costs comparable to those in the manufacture of Portland cement. The product is obtained in the form of a sintered or semi-fused clinker which needs only to be ground for use as fertilizer.

Pot tests indicate that the plant food value of calcined phosphate is as high as that of superphosphate and other well-known phosphatic fertilizers. The product is free from diluents other than those naturally present in the phosphate rock, contains no free acid or acid salts, has excellent physical properties, and improves the physical properties of other fertilizer materials with which it is mixed. An improved product containing very little or no fluorine can be made and used as a substitute for bone meal in mineral supplements for livestock feeding.

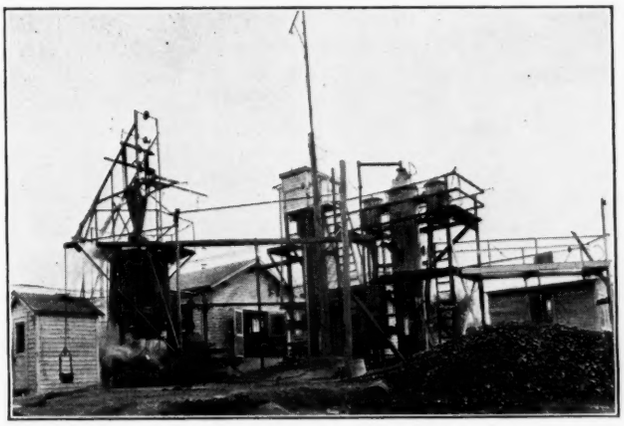


Figure I. Layout of a five-ton pilot plant blast furnace for the production of phosphorus operated by the Bureau of Chemistry and Soils.

In view of the recent increase in supplies of potash throughout the world and the United States in particular, the Bureau is concentrating its efforts on increased potash utilization as illustrated by this country's potentialities for potassium sulphate, potassium phosphate, potassium nitrate and potassium carbonate. The American farmer paid, on the average, nearly $3,000,000 annually for the last ten years for one of these products alone—imported potassium sulphate.

In order to see just where these prospective materials may fit into the fertilizer picture let us consider a few charts showing first, Fig. 3, the source of nitrogen in mixed fertilizers from 1880 to 1932. The decrease in organic ammoniates through this period is most striking. The increased use of ammonia and its salts in the past ten years due largely to the establishment of a synthetic ammonia industry, and the decrease in nitrates for the same period, is of importance. Ammonia and ammonia salts are the cheaper sources of nitrogen. The nitrates are higher, and organic ammoniates are still higher, having been only slightly below $2.00 per unit for a short time, and averaging more nearly $3.00 per unit of nitrogen.

The increased use of ammonium salts in place of the organic ammoniates and nitrates, has led to an increase in the acid-forming influence of fertilizers. Dolomite, limestone and other basic materials are now being used in fertilizer mixtures in order to reduce their acid forming influence on the soil. These basic materials often supply calcium, magnesium, and other elements now known to be necessary as plant foods for some crops grown on soils deficient in these elements.

Fig. 4 gives the total plant food content of complete

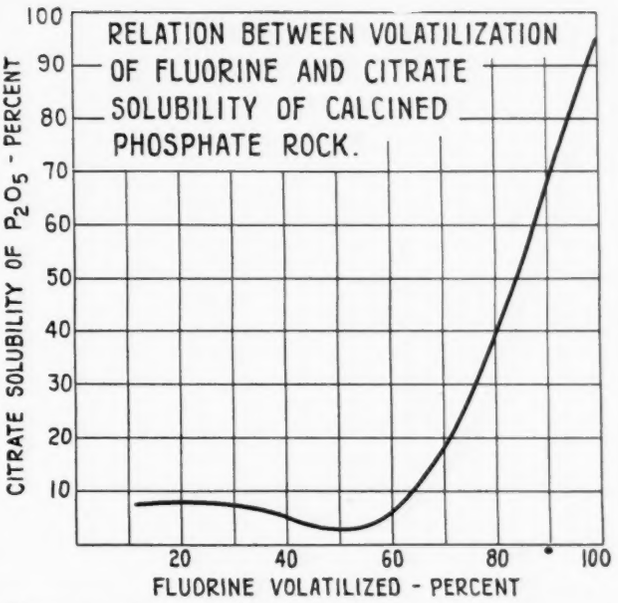


Figure II. Curve on this chart indicates that no increase in citrate solubility of the phosphate occurs until more than 60 per cent. of the total fluorine is volatilized.

mixed fertilizers from 1880 to 1932, as well as the composition in terms of nitrogen, available phosphoric acid, potash, and filler. The trend for the last ten years is toward a marked increase in plant food content. It would seem that ammoniated peat, the basic materials dolomite, limestone, etc. might replace much of the so-called filler, giving a better and more efficient fertilizer per unit of plant food.

Superphosphate and double superphosphate are examples of fertilizer materials that differ only in their content of one inert component. The first, having a plant food content of 16-20 per cent., is classed as an ordinary or low analysis material, while the second, having a plant food content of 40-48 per cent., is a concentrated or high analysis product.

Double superphosphate as prepared by present methods must necessarily cost more per unit of P_2O_5 than the ordinary superphosphate. It is possible, however, that improvements in the smelting methods of treating phosphate rock may change the situation. The phosphoric acid recovered by these methods is only suited for direct use as a fertilizer after being neutralized by some basic material such as phosphate rock, limestone or ammonia. The product obtained in each case is a high analysis material. The volatilization methods of treating phosphate rock thus provide a means for producing high analysis phosphates having 2-4 times the plant food content of ordinary superphosphate.

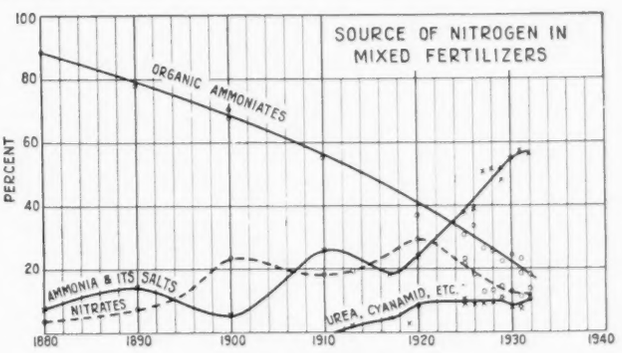


Figure III. Increased use of ammonia and its salts and the decrease in nitrates during the same period as noted on this chart is most striking.

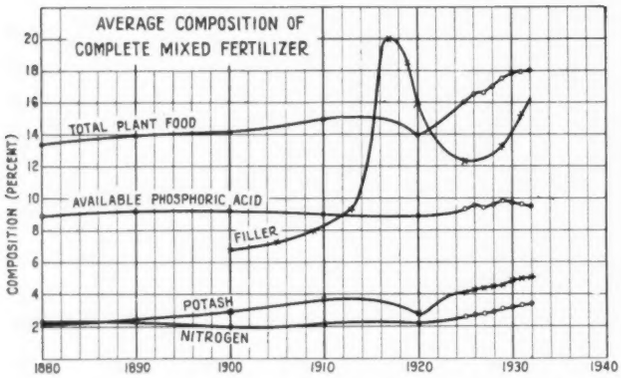


Figure IV. Curves indicate total plant food content of complete mixed fertilizers, trend showing a marked increase in plant food content for the past ten years.

Table I gives the fertilizer formulae of two fertilizer mixtures.

Table I

Fertilizer Formulae of Average and Double Strength Mixtures

Materials	*Average mixed fertilizer for 1932 3-10-5*	*High analysis fertilizer 6-20-10*
Superphosphate, 18% P_2O_5	1100 lbs.	
NH_3 (3% of superphosphate)	33	
NH_3 (7½% of double superphosphate)		66 lbs.
Double superphosphate, 45% P_2O_5		880
Potassium chloride, 50% K_2O	200	400
Organic ammoniates	100	200
Ammonium sulphate	100	200
Sodium nitrate	33	66
Dolomite	94	188
Filler, (sand, etc.)	340	
	2000 lbs.	2000 lbs.

The first of these formulae represents the average mixed fertilizer in use at the present time. The other is a high analysis mixture containing twice the plant food content. The second, or high analysis formula, differs from the first only in that double superphosphate is used in place of superphosphate and filler is omitted. Mixtures prepared according to these formulae will contain the same fertilizing components in approximately the same proportions. Both mixtures must therefore be very much alike in their chemical, physical and physiological properties. If double superphosphate should come into general use it will mean that the filler used in the average mixed fertilizer must be increased to about 50 per cent. of the mixture if its analysis formula is to remain the same as before. It would seem that a more logical procedure would be to increase the analysis formula by the elimination of filler. Methods are now available for the application of the higher analysis fertilizers in quantities which duplicate present day plant food applications. It is evident therefore that the successful production of phosphoric acid for use in double superphosphates by furnace methods may play a very important role in the fertilizer industry.

With the increasing supply of higher analysis nitrogen compounds, phosphates and potash salts, comes the trend to make higher analysis fertilizers, so that the fertilizer industry and consumers are confronted with either the manufacture, distribution and use of higher analysis products, or a marked increase in the use of filler which adds appreciably to the cost of manufacture and transportation of fertilizers.

Litharge Manufacture

PURE pig lead is melted in a reverberatory furnace in a circuar pan about 9 feet in diameter. Extending vertically through the center of this furnace is a shaft, attached to which, immediately above the pan, is a horizontal arm with numerous vertical arms projecting downward into the pan. When the lead is entirely molten, shaft is set in motion and the vertical arms stir up the lead, constantly exposing fresh surfaces to the action of the heat and air. After 24 hours, the lead has been entirely converted to litharge, a yellowish powder of about the coarseness of sand. This material is known as mechanical litharge and comprises probably 75% of all litharge used.

The litharge as it comes from the furnace is too coarse to be used in the industries. It must be milled to a fineness such that 98% will pass through a 325 mesh screen. Special mills are used for this purpose which operate in a very ingenious manner. Steel hammers mounted on a shaft revolving at a speed of about 3600 r.p.m., strike the particles and shatter them. The ground material, instead of passing out at the bottom of the mill is drawn upward from the top by a draft of air which can be regulated. This draft, or suction, will remove from the mill only particles up to a certain size. Larger particles remain in the grinding chamber to be struck again by the hammers. Thus it will be seen that the material which is collected is of a remarkable uniformity.

Another process for making litharge, which has been in use for the past few years, is the so-called subliming process. In this process, pure pig lead is melted in a kettle and discharged through a small orifice near the bottom of the kettle. Surrounding this orifice, compressed air is admitted which breaks up the lead stream into very fine particles. Heat is applied at this point and due to the extreme subdivision of the lead particles, they are instantly converted to an amorphous light yellow powder which is so fine that it appears as a yellowish smoke. This smoke, or fume, is pulled from the furnace through a number of gooseneck cooling towers by means of a large suction fan and finally blown into a baghouse. The baghouse contains four or five hundred cotton bags, each 30 feet long and 18 inches in diameter. They are closed at the top and suspended from pipes near the roof of the baghouse. The "smoke" is blown into the open bottoms of the bags and the air escapes through the pores of the cloth. The sublimed litharge is retained inside the bags and falls from there into hoppers from whence it is barreled. Sublimed litharge particles are roughly 1/10th the size of those of mechanical litharge which is some indication of the extreme fineness of this product.

Still another form of litharge is fused litharge. In this process, molten lead from a kettle is run continuously into a basin of magnesite brick. A gas flame is blown across the face of this bath of molten lead and the heat from this flame, intensified by a blast of air, forms molten litharge at a temperature far in excess of that of the mechanical furnace operation. The blast of air has also the function of keeping a small area of bright molten lead exposed. The molten litharge, floating on the bath of lead overflows at one side of the furnace. From this point the molten litharge may be handled in either of two ways. It may be cooled quickly by running it over a water-cooled plate in which case it forms thin yellowish slabs resembling (in every way except color) peanut brittle. These slabs are milled in the same type of mill that is used for mechanical litharge, to a fine yellow powder. This product is known as the yellow modification of fused litharge. THE AMERICAN ENAMELER, "How Litharge is Made,' by Miles M. Zoller, Eagle-Picher Lead Co.

Tertiary Amyl Alcohol

(Dimethyl Ethyl Carbinol)

An alcohol as reasonable in price as the more generally known lower alcohols and yet having a boiling point approximating that of water.

Pure tertiary amyl alcohol boils at 101.8°C and the technical product containing some of the isomeric compounds has a boiling range of 89-140°C. It is soluble in water to the extent of about 11% and approximately 12% water will dissolve in the alcohol.

In lacquer formulation, tertiary amyl alcohol is a good solvent for the gums used, and it has a very attractive dilution ratio and evaporation rate. It aids blush resistance because with water it forms an azeotropic mixture containing approximately one-third water.

Tertiary amyl alcohol has unusual penetrating properties. It is especially useful for improving the spread of penetrating oils and insect sprays.

Because of the ease with which tertiary amyl alcohol can be converted to the corresponding chloride or to trimethylethylene, it is very convenient to use for introducing the tertiary amyl group into other compounds. It is quite striking that such tertiary amyl derivatives usually have melting points much higher than the primary or secondary compounds.

OTHER SHARPLES AMYL COMPOUNDS

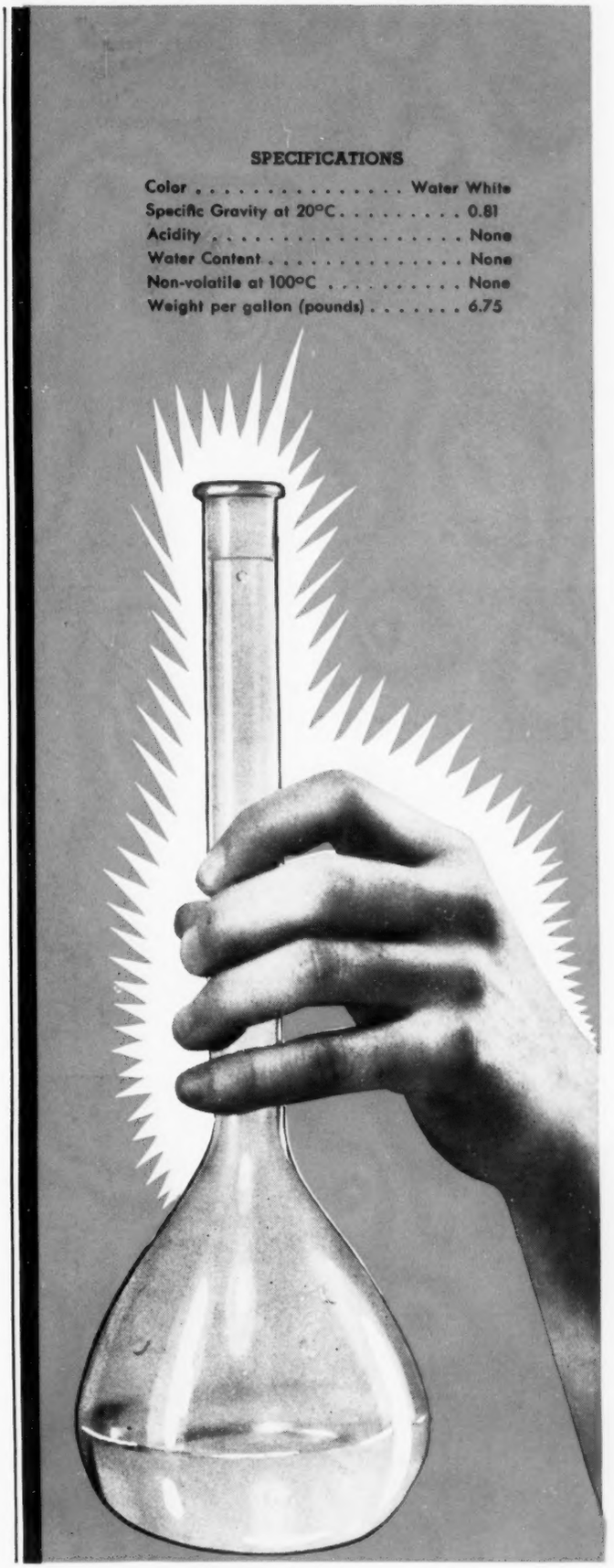
Pent-acetate	Methyl Propyl Carbinol
Monoamylamine	Diethyl Carbinol
Diamylamine	Dimethyl Ethyl Carbinol
Triamylamine	Normal Amyl Chlorides
Amyl Mercaptan	Mixed Amyl Chlorides
Diamyl Sulphide	Amyl Benzene
Normal Butyl Carbinol	Dichloro Pentanes
Iso-Butyl Carbinol	Diamylene
Secondary Butyl Carbinol	Diamyl Ether

Pentasol (Pure Amyl Alcohol)

Pentaphen (Para-Tertiary Amyl Phenol)

SPECIFICATIONS

Color	Water White
Specific Gravity at 20°C	0.81
Acidity	None
Water Content	None
Non-volatile at 100°C	None
Weight per gallon (pounds)	6.75



SHARPLES TRADE MARK SOLVENTS

THE SHARPLES SOLVENTS CORP., PHILADELPHIA

CHEMICAL

The Photographic Record

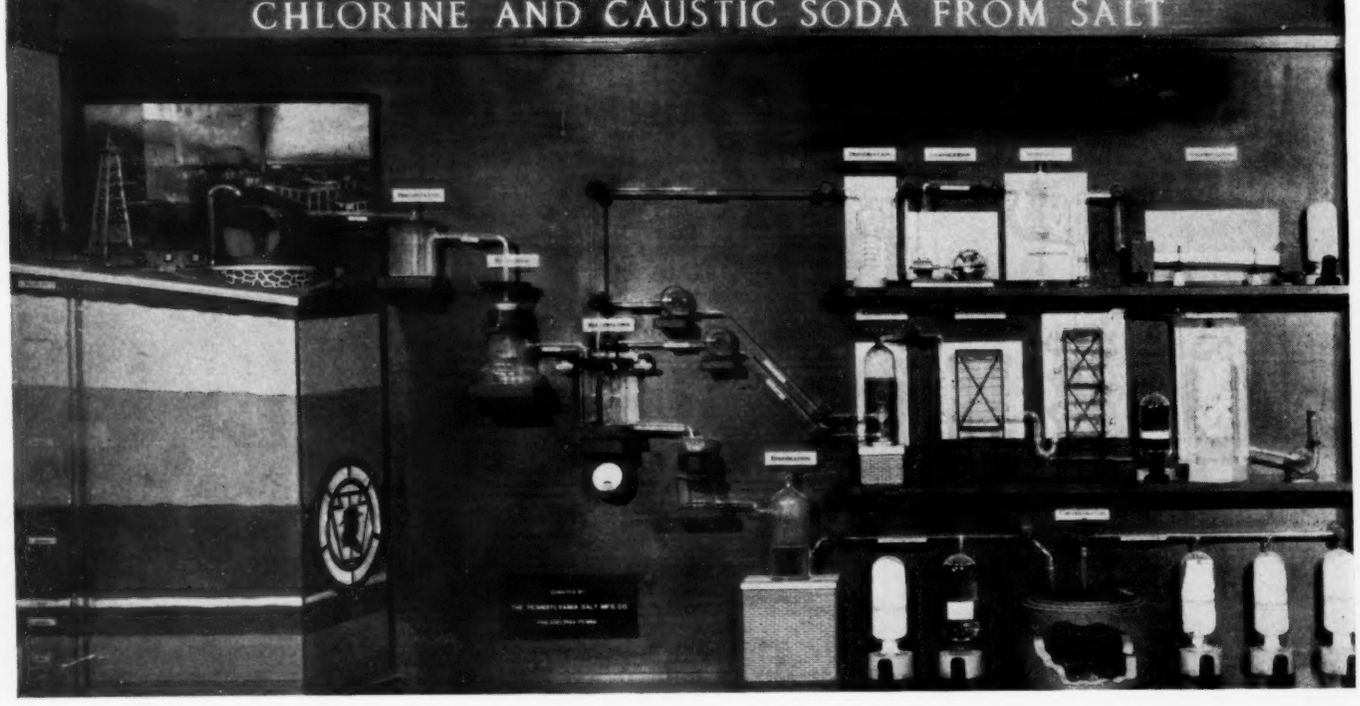
Eugene Grasselli's daughter Jane returns with her husband, Count Gradenigo, from Italian honeymoon.

In the gardens of the President of Mexico, Phil Dinkins, right, (Cyanamid) with Alfredo Schauer, Cyanamid's Manager in Mexico City.

Fred Lancaster (Diamond Alkali) watching the tennis at White Sulphur.

Francis P. Garvan's daughter Mabel, one of the first of next season's debutantes, introduced at a large party on the Garvan Estate at Roslyn, Long Island.

Pennsylvania Salt Company has erected at the Franklin Institute, at Philadelphia, a miniature working model of an electrolytic caustic operation, which works automatically, with a phonograph loud speaker synchronized to tell the story of this important chemical operation.



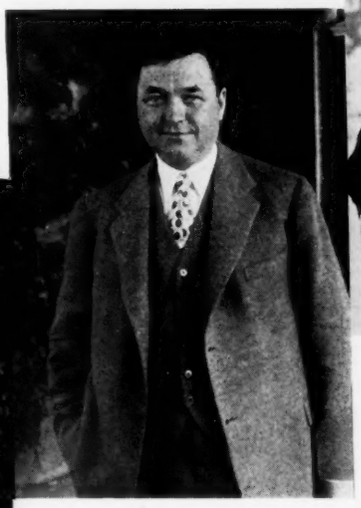
NEWS REEL

of Our Chemical Activities

Right, H. A. Goman, President, Natural Products Refining Company.

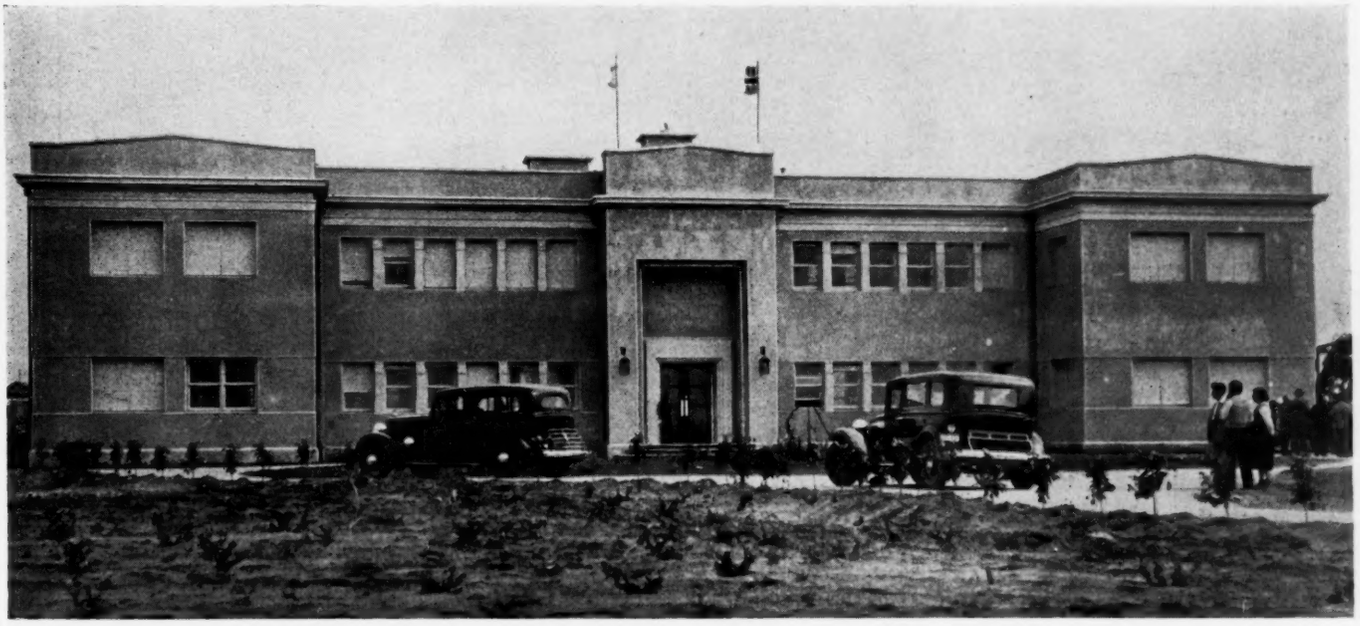
At Skytop, Pa., where the Manufacturing Chemists' Association held its annual meeting last month, these portrait snapshots of the important chemical executives were taken. Below, Stanley Weil, Vice President, Natural Products Refining Co.

Glenn Haskell, right, Vice President, U. S. Industrial Alcohol, and below, Theodore Swann, President, Swann Chemical Company (Monsanto).



Two leaders of the fine chemical industry. Left, George Merck, and right, F. F. Russe (Mallinckrodt).

In Palestine, where there is no unemployment, rather a need for more workers, there is in Rehowoth, near Tel-Aviv, a research laboratory for the study of scientific agriculture, to which has been added a new research institute under the direction of Professor Weizmann, equipped with the most modern apparatus. Known as the Weizmann Institute, this laboratory was given in memory of the young chemist, Daniel Sieff. The chief function of this institute will be to aid agriculture, keeping in mind the interdependence of science and research.



Chemical Consumption

A digest of new products and processes in process industries for the user of chemicals.

Chlor-Hydrocarbons as Liquid Dielectrics

By F. M. Clark
General Electric Company

THE use of mineral oil as an insulating, cooling, and impregnating liquid in electrical equipment was a step of major importance in the development of the electrical industry. Until recently, for all the rapid progress in the field of synthetic chemistry, no satisfactory substitute eliminating the inherent defects of mineral oil has been available. The importance of the problem compelled continued effort. The increasing demands of the electrical industry challenged the ability of chemists to produce a stable, non-oxidizing dielectric liquid.

The answer to this demand has been met in the development of a new class of synthetic liquid dielectrics, each step in the development having the two-fold object of retaining the advantageous characteristics of mineral oil while eliminating those features tending to restrict the application of dielectric liquids in apparatus design. Through the introduction of these synthetic dielectric liquids, the oil soluble, acidic, volatile and insoluble oxidation products inherent in the use of mineral oil have been eliminated. The danger of fire risk has been removed. By careful attention to the synthesis of liquids having suitable dielectric constant, not only has the physical size of condenser equipment been greatly reduced, but in other apparatus whose design includes a series arrangement of liquid dielectrics and solid insulation, the stress has been more equally distributed.

In the construction of a molecule suitable for dielectric application, the fundamental chemical consideration is stability to atmospheric oxidation. The easy acid formation in paraffin hydrocarbon series serves to eliminate this type of substance from consideration as the parent molecule. The aromatic type of hydrocarbon, however, possesses the necessary stability to atmospheric oxidation even at the higher ranges of temperature met in the commercial application of electrical machines. Aromatic molecules, with the exception of the simplest members of the series (benzene) are solids, poorly suited for dielectric application because of their marked crystallinity when pure. Their inflammability finally serves to eliminate this type of compound from practical consideration.

The higher chlorinated hydrocarbons are characterized by their non-inflammable properties. The chlorinated derivatives of the paraffinic hydrocarbons, however, are characterized by an instability which at once eliminates them from consideration. The chlorinated derivatives of the aromatic hydrocarbons, however, are extremely stable. The halogen is bound firmly, far more so than in the halogenated paraffin series, and can be removed only with difficulty.

With the selection of the basic type of molecule and the constituent desired, the problem of degree of substitution necessary to produce the required non-inflammability of the liquid and the arc-formed gases is at once presented.

When the hydrogen and chlorine are present in chemical equivalent amounts (pentachlor diphenyl), hydrogen gas is absent in the arc-evolved gases, which consist practically of pure hydrogen chloride. Such a compound is, of course, non-inflammable in the liquid or vapor state. The degree of chlorination necessary in the desired synthetic liquid dielectric is thus clearly indicated.

The commercial application of chlorinated liquids has been retarded, due to the general belief that such materials easily evolve phosgene on decomposition. Such is not true. Even in an excess of oxygen, phosgene is not formed from chlorinated hydrocarbons unless the molecule possesses more than a chemical equivalent of the chlorine to the amount of hydrogen present. From the mono-, di- or tri-chlorinated benzenes and the chlorinated diphenyls up to and including the pentachlor, no phosgene could be obtained even though an intimate mixture of the liquid vapor and oxygen or air was slowly passed through a heated tube over the ranges of temperature from 400° C to 1,000° C.

When pure, these materials with the exception of the simpler members are solids of well-defined crystalline structure and of high melting-point. Technical mixtures of the various isomers, however, are not only liquid, but easily form "eutectic" mixtures of low melting-point. Diphenyl, for example, when chlorinated to the penta stage, yields a technical mixture of the isomers which on distillation gives a nearly colorless liquid having a pour

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Although it is always mild and safe, GRASSELLI Formic Acid has the faculty of completely exhausting the dye. Being both an acid and aldehyde, it has properties not obtainable with other exhaust agents—producing more brilliant colors in dyed fabrics, with no streaky or cloudy effects, and always level colors even in cross dyeing.

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Carbonate of Soda
Caustic Soda, Solid and Flake
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Nitric Acid
Oxalic Acid
Phosphate of Soda
Silicate of Soda
Sulphate of Alumina
Sulphate of Soda, Anhydrous
Sulphite of Soda
Sulphide of Soda
Sulphuric Acid
Tri-Sodium Phosphate

point of 10° C. with no crystal formation and possessing electrical properties well suited to commercial application. Other liquids of like composition might well be listed. The chlorinated diphenyls, however, serve well to illustrate the physical behavior of the synthetic liquid dielectric yielding the desired oxidation stability, coupled with fire and explosion elimination.

Pentachlor diphenyl prepared by the direct chlorination of diphenyl in the presence of an iron catalyst, with subsequent fractional distillation, is a viscous liquid with a pour point of 10° C. Having a dielectric constant of approximately 5 at 25° C., more than twice that of mineral oil, this product is well-suited for application in condenser design. For a 440 volt, 6 mf. condenser designed for continuous voltage application, the introduction of pentachlor diphenyl in place of the usual mineral oil gives more than a 50 per cent. reduction in total physical volume. Despite exposure to severe oxidation conditions, no evolution of free chlorides has been detected. Tested at 470 v.p.m., no deterioration in power factor has been observed over a period of 260 days. Extensive commercial tests over longer periods of time have substantiated the chemical and electrical stability of this synthetic liquid dielectric.

It is in its arcing characteristics, however, that pentachlor diphenyl shows its non-inflammable and non-explosive properties. When arced, the liquid not only gives less gas than mineral oil tested under similar conditions, but the gases evolved are non-inflammable. Analysis of the arc-evolved gases show the following approximate composition: Hydrogen chloride, greater than 99 per cent.; hydrogen, none; chlorine, none; phosgene, none; carbon monoxide, none; carbon dioxide, none; unsaturated hydrocarbons, less than 0.4 per cent.; saturated hydrocarbons, none.

Pentachlor diphenyl, although possessing characteristics ideally suited for many dielectric applications, is limited because of its high viscosity and relatively high pour point. For general use in transformers, these factors react against its easy adoption. To overcome this difficulty, recourse is made to the remarkable ability already mentioned by which the presence of pentachlor diphenyl prevents the crystallization of materials of relatively high solidification temperature. Mixtures such as pentachlor-diphenyl and trichlorbenzene being composed only of materials whose molecules contain chlorine in at least a chemical equivalent of the hydrogen present, possess all the non-inflammable and non-explosive characteristics ascribed to pentachlor diphenyl itself; as well as exhibiting equally high dielectric strength and chemical stability.

Although the characteristics of such blended synthetic mixtures may be varied over a wide range, a composition containing trichlorbenzene and pentachlor diphenyl, well suited for general application where a non-viscous liquid cooling and dielectric medium is required, possesses the following physical properties: Burn, none; pour point,—18° C.; specify gravity at 15.5/15.5° C., 1.530; viscosity at 37.8° C. (Saybolt Universal), 75 seconds; viscosity at 98.9° C. (Saybolt Universal), 35 seconds.

The introduction of synthetic liquid dielectrics in commercial apparatus marks an important step in engineering design. The replacement of the usual mineral oil cannot be accomplished, however, without the continued assistance of chemists. The development of dielectric varnishes and other solid composite products inert to the new types of synthetic liquid dielectrics offers a further field for chemical exploitation.

* Paper presented at the sixty-fifth general meeting of the Electrochemical Society, held at Asheville, North Carolina, April 26-28, 1934.

Soap

Perfumed Non-Injurious Sea Water Soaps

Excellent preparations for ordinary washing purposes, especially for household purposes, can be obtained by mixing together one or more salts of the reaction products of sulfuric acid on higher molecular saturated aliphatic alcohols containing more than eight carbon atoms with those of the reaction products of sulphuric acid on unsaturated higher molecular fatty alcohols, details of which are given in British Patent Spec. 406,565. The preparations can be worked up and/or shaped in any suitable manner, for example in a soap mill, into various compact forms, such as tablets, ribbons, flakes, needles, vermicelli or the like. In this way it is possible to obtain hard pieces of high polish which are not only unaffected by the lime and magnesia salts of the washing water but which also lather excellently even in very salty water, especially sea water. This effect is achieved by homogeneously working up the neutralized sulfuric acid reaction products of higher molecular saturated fatty alcohols together with those of an unsaturated nature and then pressing or otherwise working or shaping them to pieces suitable for toilet use and the like.

Rubber

Finishing Carpets With Latex

Carpets and rugs when woven are limp and a coat of glue size is usually applied to stiffen the material. This can be done with the use of latex without changing existing equipment; the slightest increase in cost being more than compensated for by the advantages obtained and the ease of the process. The latex soaks through the basic construction of the carpet, after which vulcanization on a waterproof backing results. This has the advantage of gripping a smooth floor much more satisfactorily. Such carpeting can also be cut without binding the edges as the vulcanized rubber keeps the cut ends from unravelling. The drying and curing is possible in from 20 to 30 minutes at 150-175°F.

Fire-Proofing Rubber Tiling

Severe tests on samples of rubber tiling impregnated with I. C. I's. "Seekay" wax have established its efficiency as a fireproofing agent. Standard tests include placing the processed rubber for a specified time in the hottest part of the flame of a Bunsen burner, particular attention being paid to the fact that the flame gets no hold on the rubber. Treatment with this product is an extension of the process already successfully applied to electrical cables, and may be carried out without detriment to the color or surface of the rubber, or to those qualities, such as flexibility and tensile strength, in which lie the value of rubber as a structural material.

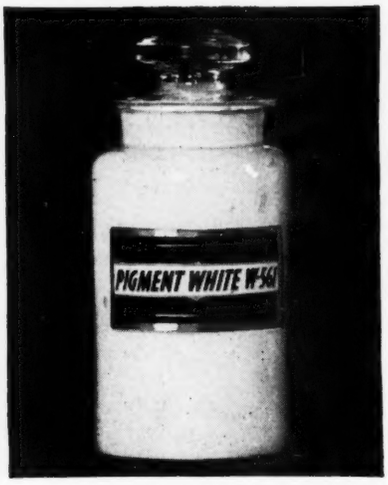
Crumb Rubber

Rubber compositions with crumb-like characteristics that can be dried on a mill ready for calendering, extruding, or molding are practical according to a method given in U. S. P. 1,952,041. This feature is obtained first by adding to an aqueous dispersion of rubber certain compounding ingredients but which when added in sufficient amounts to latex cause coagulation. Their coagulative effect is, however, arrested at this stage by suitable stabilizing substances, until the latex and compounding ingredients have been thoroughly mixed. The

Chemical Specialties

ORATOL

A specially sulphonated, fatty derivative which is resistant to lime, magnesium salts, sulphuric acid and mineral acids. It is recommended for unusual penetration and scouring silk, cotton and wool. Only a small proportion used in the wash for printed silks brightens the colors and pigment white objects.

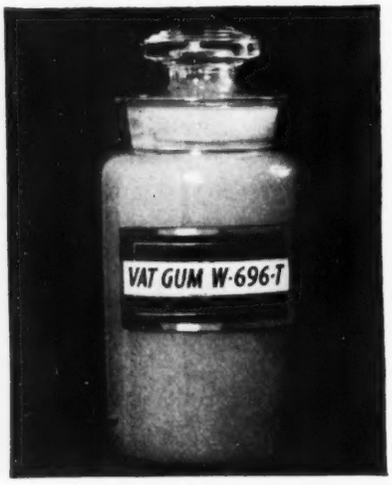


PIGMENT WHITE W-561

Our Pigment White W-561-A is especially adjusted for use with any natural gum thickener. Pigment White W-561-T is to be used in conjunction with a starch or starch-tragacanth thickener. The finely suspended pigments of these two products give a free flowing body to the printing paste.

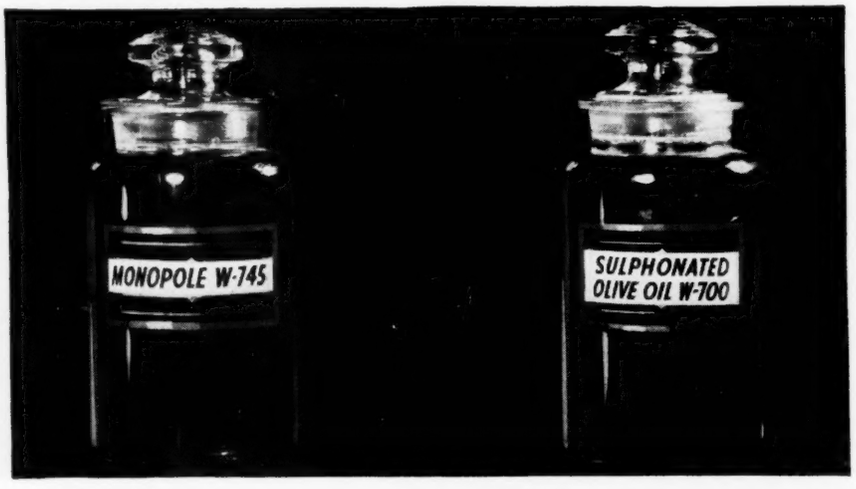
BACKFILL BINDER K

This product has been used by a number of mills with unusual success. Being highly soluble it dissolves readily in cold water and is more economical to use. Its adhesive qualities prevent the sizing from dusting off, and its thickening power is much greater than starch.



VAT GUM W-696-T

This thickener for vat colors contains the required amounts of hydrosulphite and alkali. It gives greatest color values, full penetration, sharp outlines; and its smooth, syrupy body does not go ropy.



MONOPOLE OIL W-745 **SULPHONATED OLIVE OIL W-700**

Our Monopole Oil W-745 is a double sulphonated castor product and Sulphonated Olive Oil W-700 is an all olive oil product. These oils are highly sulphonated and contain the maximum quantity of combined SO_3. They are completely soluble and resistant to hard water and organic acids.

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protective influence of the stabilizing agents is then lowered by the presence of other specified compounding ingredients added in sufficient quantity to induce agglomeration or incipient coagulation, but insufficient to lead to the formation of a coherent coagulum.

Patents—Rubber

Formaldehyde & mercaptobenzo-thiazole in vulcanization accelerator. No. 1,960,197. M. H. Zimmermann, to Firestone Tire & Rubber Co., Akron, O.

Benzine rubber solution & amber oil in making seamless rubber articles. No. 1,959,701. J. Balog, to G. Balog, Vienna, Austria.

Turpene wood distillate & sulfuric acid process to reclaim rubber. No. 1,959,576. T. J. Fairley & R. Frye, to W. J. and M. P. Hunter, Shreveport, La.

Trade mark, for chemicals used as rubber accelerators. No. 313,291. du Pont & Co., Wilmington, Del.

Rubber solution with comminuted chrome-tanned leather, as adhesive. No. 1,953,479. E. Hazell & H. F. Stowe, to Naugatuck Chem. Co., Conn.

Rubber antioxidant containing naphthylaminopropionic acid. No. 1,958,469. L. J. Christmann & C. J. Romieux, to Amer. Cyanamid Co., N. Y. City.

Textiles

New Textile Fibre

"Fibro," produced from wood pulp, but specially strengthened so that it can be cut into required lengths and mixed with any kind of cotton, from the coarsest to the finest, has been developed as the result of prolonged experiments carried out by Courtaulds and the Shirley Institute. It threatens to become a serious rival to Egyptian cotton in the production of high-class textile fabrics.

New Mercerizing Process

Before mercerizing a permanganate bleach is applied. The yarn is boiled in the presence of some detergent agent in the usual manner, then rinsed and plunged in a bath containing 0.05 to 0.5 grm. of permanganate per litre, for 15 to 20 minutes at a temperature of 35 to 40° C. To effect oxidation, the goods are hung in the air for about half an hour, centrifuged and mercerized. After this treatment, scour, acidify and eliminate any manganese dioxide by treatment with sulfide. Finally revivify with fatty alcohol. In double mercerizing proceed as follows: boiled yarns are mercerized under heavy tension, and after scouring and neutralizing, passed through a mercerizing machine under light tension. This gives a more brilliant lustre, most suitable for cotton yarns which are to be dyed with Indanthrenes. *The Dyer & Calico Printer.*

New Stripping Agents

Two new chemical compounds, Lissolamines A and V, products of the British Dyestuffs Corporation, play an important part in eliminating waste. Many modern dyes are so fast that no chemical will bleach them save those which are so strong as to destroy the fabric. These agents allow dyeings formerly looked upon as unbleachable to be readily stripped back again to the white fabric. Their value in rectifying spoiled dyeings is obvious, but the nature of the stripping process is such that it is now possible to use redundant stocks of many colors which can now be stripped to a white, whereas formerly they could only have been jobbed off or redyed black or dark shades.

Month's New Dyes

Chromoxane Brilliant Violet BE, a new chrome-topped violet, is being offered by General Dyestuff. Dyed in the usual way from an acid bath and after-treated with chrome, it produces bright violet shade of very good fastness to fulling, decatizing, carbonizing and potting; fastness to washing, water and salt-water, perspiration and hot pressing also very good.

Indanthren Scarlet F3G Suprafix and Indanthren Printing Brown TM Suprafix are two new valuable printing colors being offered by the same company. Scarlet F3G produces a bright yellowish scarlet shade and Brown TM a full chocolate brown shade, both of very good fastness to light, washing and chlorine and best printed according to the usual potash-Rongalite process.

Fast Brown Salt RR also released by General Dyestuff will give red-brown dischargeable shades on Naphthol AS-OL. The Salt is also recommended for print-on styles on the same naphthol ground.

Patents—Textile

Tetra-sulfuric azine ester in dyeing. No. 1,962,142. D. A. W. Fairweather & J. Thomas, to Scottish Dyes, L'td, Grangemouth, Scot.

Sodium dinitro benzenesulfonate in processing textiles. No. 1,962,085. D. H. Powers, to Rohm & Haas, Phila.

Purification of base fibers, ammonia & borax bath. No. 1,961,545. H. P. Bassett, Cynthiana, Ky.

Mfr., use & dispersion of soluble and insoluble coloring matter compounds. Nos. 1,595,352-3. G. H. Ellis, H. C. Olpin & E. W. Kirk, England, to Celanese Corp., N. Y. City.

Sulfoxylate & hypochlorite stripping of textiles to remove dyes. No. 1,958,483. K. C. Loughlin, to Celanese Corp., N. Y. City.

Metal

Electroplating Rubber

A method of electroplating rubber and combining it with metals was reported by Dr. Andrew Szeerari of the Universities of Budapest and Berlin. Commercial importance was attached to the discovery because the rubber-metal composition can be used to line pipes, making them impervious to acids. Major uses include sewer pipes and those installed to discharge waste from steel plants.

Finishing Cast Aluminum

In the finishing of cast-aluminum street and road signs, the first and most important job is to clean and prepare the surfaces properly in order to counteract its greasy surface before applying the first coat of finishing material. J. E. Greene, in *Industrial Finishing*, gives two good solutions for this. One is a caustic potash or concentrated lye mixed on the basis of 2-lbs. to the gallon of water; the other is a 25% solution of acetic acid.

The aluminum castings are dipped in a tank of this conditioning solution and allowed to hang submerged for 20 to 30 minutes, or until the surface of the metal turns to a grayish black. Next they are dipped first into a tank of cold water to rinse and neutralize the acid, then into a tank of hot water. Following this, the castings are allowed to dry naturally, after which they are ready for the priming coat.

In one modern plant exterior lacquer enamels are used; another uses air-dry and bake-type synthetic enamels. For the lacquer finish a red oxide lacquer primer is first applied. The signs are then painted in various combinations of color and finished with a final protective coating consisting of one or more coats of exterior, tarnish-proof, clear lacquer.

For aluminum bronze finish the red oxide primer is omitted; a coat of the bronze mixture taking its place. The vehicle for mixing the bronze should be neutral to the top coat of tarnish-proof, clear lacquer; also it must have the proper adhesion to the metal and it must be adapted to exterior exposure.

With the synthetic bake-enamel finish, the plain castings are first cleaned, then subjected to a baking, the time and temperature being equal to the highest temperature of any of the succeeding finish coats. This is for the purpose of expelling all air from the pores of the metal to avoid possible air blisters in the succeeding coats of finish. No

separate coat of primer is required, as the enamel serves both as a priming and finishing coat.

These two finishes have given excellent results, withstanding exterior exposure for long periods of time and showing no signs of peeling or discoloring.

Patents—Metals

Sulfuric acid pickling process for ferrous metals. No. 1,962,295. P. F. Bruins, to A. O. Smith Corp., Milwaukee, Wisc.

For inhibiting the solution of metal in contact with acids. Nos. 1,961,096-7. O. D. Cunningham, to P. C. Reilly, Indianapolis, Ind.

Mercuric chloride, copper sulfate & silver nitrate in aluminous metal coating process. No. 1,960,838. A. P. Bixler, to Advance Eng. Corp., Duncannon, Pa.

Use of an agent selected from three groups of acids in method of casting magnesium and its alloys. Nos. 1,960,711-3. H. A. Reimers, to Dow Chem. Co., Midland, Mich.

Patents—Miscellaneous

Cellulose

Sheeting material of Cellophane. No. 1,962,190. G. E. Ginn, Des Moines, Ia.

For saponifying cell. esters to a predetermined degree. No. 1,962,139. C. Dreyfus & W. Whitehead, to Celanese Corp., N. Y. City.

Pyroxylin tubing, for cold cementing. No. 1,962,077. H. Kaufman, to Du Pont Viscoloid Co., Wilmington, Del.

Water-expelling agents in making sheets from aqueous solution of cellulose. No. 1,961,316. R. Weingand, Bomlitz, Germany.

Treatment of cellulose regenerated from viscose in sheet form. No. 1,961,268. J. Voss, Ger., to Du Pont Cellophane Co., N. Y. City.

For low viscosity cellulose nitrate. No. 1,961,251. V. B. Sease, to Du Pont & Co., Wilmington, Del.

Fixing concentration of stable liquid pigments from cellulose, for lacquers, varnishes, etc. No. 1,961,229. J. Ladrette, to Du Pont Rayon Co., N. Y. City.

Cellulose derivative insulating composition for aircraft. No. 1,961,208. Camille Dreyfus, N. Y. City.

Trade mark, "Sorbtex," No. 348,586. Chem. preparation to increase absorbency of cellulose products. Ralph L. Dombrower Co., Richmond, Va.

Process for fireproofing cellulose materials. No. 1,961,108. M. Leatherman, Hyattsville, Md., to the free use of the Public in the U. S.

Composition of 7 ingredients for flameproofing cellulose media. No. 1,961,045. F. W. Hochstetter, to Treesdale Labs., Pittsburgh, Pa.

Cellulose aralkyl ether plastics. No. 1,960,641. L. Lilienfeld, Vienna.

Formula for cellulose ester layer in laminated glass. No. 1,960,520. G. B. Watkins, to Libbey-Owens-Ford Glass Co., Toledo, O.

Slightly hydrolyzed cellulose acetate-propionate with propylene chloride & alcohol for flexible sheeting. No. 1,960,185. C. J. Malm, to Eastman Kodak Co., Rochester, N. Y.

Practically pure cellulose from raw material of any origin. No. 1,959,734. F. C. Palazzo & F. Palazzo, Florence, Italy.

Purification of organic esters of cellulose. No. 1,959,446. J. Scheidegger, to Celanese Corp., N. Y. City.

Trade mark, laminated glass. No. 313,338. Rohm & Haas. Philadelphia, Pa.

Coatings

Cellulose nitrate coating composition. No. 1,962,151. M. H. Morrison & E. H. Nollau, to Du Pont & Co., Wilmington, Del.

Nitrocellulose & compatible metal salt, of naphthenic or resin class, in organo metallic protective agent. No. 1,962,132. Hamilton Bradshaw, to Du Pont & Co., Wilmington, Del.

Coating—nitrocellulose, an ester of abietic acid & solvent. No. 1,961,931. I. W. Humphrey, to Hercules Powder Co., Wilmington, Del.

Paint & coating base from euphorbia lactea, rubber gum & resin. No. 1,960,252. J. Mano, to Hosnoler Corp., N. Y. City.

Anti-fouling paint especially for marine uses. No. 1,960,251. J. Mano, to Hosnoler Corp., N. Y. City.

Coating—nitrocellulose, an ester of abietic acid & solvent. No. 1,959,408. W. S. Calcott, A. S. Carter & F. B. Downing, to Du Pont & Co., Wilmington, Del.

Polyhydric alcohol-polybasic acid resin floor paint for coating base. No. 1,959,363. H. H. Hopkins, to Du Pont & Co., Wilmington, Del.

Patent held not infringed. No. 1,229,964. Liquid coating. S. Jacobs vs. Barrett Varnish Co. et al.

Company Booklets

C205. American Cyanamid Co., 30 Rockefeller Plaza, N. Y. City. July-August issue of American Hortigraphs and Agronomic Review digests the current developments in soil management, crop production, and marketing in an editorial style that fits exactly the peculiar requirements of the farmer and does a job that many of the agricultural trade papers might well envy.

C206. Columbia Alkali Corp., Barberton, Ohio. A brand new booklet reports on detailed tests on "Col-Rec" showing conclusively that it improves the burning qualities of coal plus 8 other decidedly impressive advantages that will instantly arouse the interest of plant managers.

C207. Consolidated Products Co., 15 Park Row, N. Y. City. June issue of Consolidated News contains many interesting news items on equipment. Plant managers who are buyers of any sort of equipment should receive this monthly publication regularly for which there is no charge.

C208. Diamond Alkali Co., Pittsburgh. A new 4-page circular calls to the attention of users of alkalies the watch-like precision quality of Diamond alkalies.

C209. E. I. du Pont de Nemours & Co. (R. & H. Chemicals Dept.), Wilmington, Del. An operating manual for copper, brass, bronze and zinc plating with Du Pont copper and zinc cyanides. This manual presents information on specifications and methods of using copper and zinc cyanides produced by Du Pont. Sections are devoted to instructions on making the plating solution, operating, analyzing the solution and cleaning the metal prior to plating. Under the 22 divisions of the general subject there are such discussions as the advantages of using metal cyanides, the commercial value of metal cyanides over acid solutions, copper plating preparatory to localized hardening of steel, preparation of plating baths, formulas for solutions, methods of analysis and various others.

C210. The Eagle Picher Lead Co., Cincinnati, Ohio. Month in and month out this splendid house-organ (*The Painters' Eagle*) does a fine job of placing merchandising information of various kinds in the hands of painters, and in addition, successfully attempts to answer technical problems for them as well.

C211. Eastman Kodak Co., Rochester, N. Y. July issue of *Synthetic Organic Chemicals* discusses the chelate compounds. Second article deals with the sugar acids.

C212. General Plastics, North Tonawanda, N. Y. A brand new booklet covers the main uses of molded plastics in packaging—caps, boxes, displays, jars, etc. To the packer of materials who is eager to know more about the use of plastics the book brings a wealth of valuable information.

C213. Givaudan-Delawanna, Inc., 80 5th Ave., N. Y. City. May issue of *The Givaudanian* contains a pertinent article on "Research Costs Money—Who Pays For It?" also another describing the advantages of "Paratints" for bath salts or "Paradi" blocks. Chemical specialty manufacturers should receive this interesting monthly regularly for many profitable ideas are presented.

C214. Grasselli Chemical Co., 629 Euclid Ave., Cleveland. Grasselli has just recently entered into the manufacture of formaldehyde dust (specially effective in preventing damping) and a new booklet describes what, when, and how to treat.

C215. Grasselli Chemical Co. Electroplaters should receive the valuable Cadalyte Service Bulletin, published monthly. This department will be glad to arrange this for readers.

C216. Hercules Powder Co., Wilmington, Del. Company has released pages 75 to 83 of the nitrocellulose handbook. This addition contains new material entitled "Relation of Viscosity Type Nitrocelluiose to Usable Concentrations." Information aids in a better understanding of the relationships between nitrocelluloses of different viscosities, particularly in reference to the concentrations that can be used for various purposes. It will assist also in solving some of the detailed problems involved in selecting nitrocellulose for particular purposes. Three charts (2 separate) are included with these pages. The large charts have been reproduced on heavy cardboard suitable for hanging on the wall. They will be furnished ready for hanging for those who desire them.

C217. Mallinckrodt Chemical Wks., St. Louis. June price list shows several important changes. Users of fine, medicinal, analytical or photographic chemicals should receive this booklet regularly.

C218. Merck & Co., Rahway, N. J. June price list shows several important price changes.

C219. Philadelphia Quartz Co., 121 S. 3rd st., Philadelphia. June *P's & Q's* discusses most interestingly some new, novel, and very unusual uses for silicates that one would hardly expect and which are, in fact, the result of intensive research. Introductory to these is an illuminating viewpoint on the education of chemical engineering students.

C220. Rossville Commercial Alcohol Corp., Terre Haute, Ind. *Alcohol Talks* for June discusses in an informal way the properties and uses of alcohol.

C221. Silica Products Co., 700 Baltimore ave., Kansas City, Mo. A new 40-page booklet (Bull. No. 107), specially well illustrated, tells authoritatively the story of bentonite—its properties, sources, geology, production, uses, etc. This is a real contribution to the literature on bentonite.

C222. The Synthane Corp., Oaks, Pa., manufacturer of Synthane laminated Bakelite, has issued an interesting new laminated Bakelite sample book. In handy pocket size and profusely illustrated, it gives excellent reproductions of sheets, rods, tubes, fabricated parts and possible machine operations. A distinctive feature is the presentation of actual samples of the material. Samples of Synthane have been slipped into paper envelopes on the right hand pages from which they can be easily removed for inspection. On the opposite, left hand pages, the properties, characteristics, colors, sizes, grades and thicknesses are condensed to short paragraphs that can be read in a few moments. Standards of quality and test values are in the back.

C223. Taylor & Co., Norristown, Pa. A most strikingly effective use of out-of-the-ordinary photographs illustrating the manufacture and application of both vulcanized and phenol fibre makes the release of this brochure a real event. Need it be said that present users and prospective users should have a copy at hand?

C224. Foote Mineral Co., 16th & Summer sts., Philadelphia. June issue of *Foote Prints* contains a very complete article on lithium ores and salts.

C225. The Neville Co., Pittsburgh, Pa. Company has just released a new loose-leaf style booklet which gives complete details, physical and chemical properties, containers, etc., on its numerous coal by-products, including water white solvents, solvent naphthas, blended naphthas, indene-coumarone resins, creosote oils, tar coatings, refined tars, yellow hi-flash solvent naphtha, heavy naphtha, etc. Users of any of these products should most certainly have this booklet and hold it for further additions. The information is invaluable and the booklet is a noteworthy effort to bring exact data to consumers of solvents, resin users, paint, varnish and lacquer manufacturers, etc.

Chemical Industries,

25 Spruce Street, New York City.

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C. July

Chemical Production

A digest of plant management, design, equipment and containers for the makers of chemicals

Sulfur In Foreign Markets

A Review of the International Situation

Hitherto, most of the sulfur in pyrites has been converted into sulfuric acid. It has not escaped notice, however, that considerable economies might be made if this sulfur could be recovered in elemental form, since not only is there an obvious saving in freight on sulfur compared with pyrites, but also the copper content may be concentrated and smelted at the mine. Moreover, there are many markets for elemental sulfur not normally open to producers of pyrites; while finally the fact that deposits of pyrites are far more widely distributed than those of sulfur gives an additional impetus, particularly in countries where economic nationalism has a strong foothold.

There are only two plants so far making sulfur from pyrites—one near Thamshavn in Norway, owned by the Orkla Gruber A.B., and the other in Spain, owned by Rio Tinto—and the combined output is only about 70,000 tons per year, or scarcely one-fifth of the Italian production alone, but the process appears to be fairly well established now so far as the technical side is concerned, and costs are competitive on the basis of the present price of sulfur. Moreover, although this is not, of course, a synthetic process, hitherto on most occasions where a serious trial of strength has taken place between chemical technique and a product obtainable naturally, such as indigo or Chile nitrate, the newer method has had the best of it.

Most of the world production of sulfur comes from the U. S., which in '29, year of maximum output, produced 84% of the total. Greater part of the American sulfur (98% in '32) comes from Texas. Large stocks are carried; at the end of last year there were 2,780,000 tons, having been reduced from 3,250,000 tons at the end of '31; so that on the basis of '33 U. S. shipments (1,647,000 tons), current stocks represent nearly a year and three-quarters' supply. Price, however, is held at a very constant level—$18 per ton at the mine from '29 up to the present time. Proportion of exports to total shipments varies a good deal—in '33, when exports made a sharp recovery compared with the previous year, it was 32%; chief importers of American sulfur being Canada, which took 23% of the total exports in '33, largely for the paper industry, France, Germany, the United Kingdom and Australia.

Control of the world sulfur industry rests virtually in the hands of these few American producers, who control all exports through the American Sulphur Export Association. The Italians, who are the next most important producers (11% of the total in '29), have not played their cards very well so far as commercial policy is concerned, in view of the fact that their costs are definitely higher than those of the Americans.

By an international agreement made in '23, the Sicilian share of the world markets was fixed at 22%, but partly owing to the enormous increase in their stocks between '29 and '32, and partly because producers were controlled by a compulsory Sulphur Consortium which was opposed to any substantial restriction of production, the Sicilian industry attempted on several occasions to secure a larger export quota, although their existing quota was probably far above what their sales would have been if the Americans had resorted to open competition. Failure of these attempts led to the abrogation by the Italian Government of the American-Sicilian agreement and the compulsory dissolution of the Consortium.

Another factor which influenced the Italian Government in taking this step was the growth of the sulfur production in Central Italy, chiefly under the control of the Montecatini combine, which is responsible for 80-85% of the Central Italian production. The '23 agreement made no provision for the latter, which increased from 38,700 metric tons in '23 to 98,923 tons in '33, compared with corresponding figures of 214,500 tons and 249,297 tons in the case of Sicily. Throughout the decade Montecatini was, moreover, in a stronger position than the Sicilians, since although its wage costs were higher it offset this to a substantial extent by mechanization, and owing to its varied interests it could afford to restrict production when necessary.

A commission appointed by the Ministry of Corporations secured certain concessions for the Central Italian industry, but it was clear that either the latter would have to have a substantial permanent quota or the Consortium would have to be dissolved and a free market returned to. The 2nd course was adopted in July, '32, and existing Sicilian stocks were taken over jointly by the Bank of Sicily and the Sicilian Central Bank of Palermo at a net average figure of 300 lire per ton under an agreement to dispose of them over a period of 6 years to avoid flooding the market.

Increase in American exports last year greatly increased the difficulties of the Italian industry. Since the dissolution of the Consortium several attempts have been made to resuscitate it in such a way as to bring both Central Italy and Sicily within its control, but these have failed. The Sicilians have recently again been increasing production, and stocks in private hands are estimated to have risen to 200,000 tons.

Finally, at the end of last year, the Italian Government was forced to intervene; and a Central Sulphur Sales Bureau was formed with power to market the entire output of Italian sulfur. Four grades of sulfur are to be distinguished, and the Government has agreed to maintain a minimum price to the producers for each of these 4 grades, the difference between this minimum and the market price as determined by American sales to be made up by a Government subsidy. Meanwhile, the Sales Bureau has been instructed to meet American competition in all markets even when this involves a considerable loss, and a credit of Lire 10 millions has been advanced for this purpose.

Plants for the production of sulfur from pyrites do not therefore start on large-scale operation amid very favorable economic surroundings. With the enormous stocks available, it is going to be some time before any possible increase in world consumption has much effect, although there are definite signs of such increases. The use of sulfur as an insecticide and fungicide is growing; the rayon industry has enlarged the consumption of carbon bisulfide and sulfuric acid, while any recovery in the rubber and wood pulp industries must quickly affect sulfur. On the other hand, the desire of countries with reserves of pyrites to make themselves independent of imported sulfur is likely sooner or later to lead to the establishment of numerous small plants for this purpose, with resultant aggravation of the sulfur position. Whether this drives the chief natural sulfur producers together again remains to be seen.—*The Economist* (British), June 2, p. 1182.

Heavy Chemicals

Production of phosphoric acid from phosphorus by the procedure of oxidizing the latter with water in autoclaves at high pressures (300-400° C.), the hydrogen evolved in the operation being obtained in the compressed state and suitable for ammonia synthesis, is again mentioned by Russian research chemists, who find that the oxidation by water of finely divided red phosphorus occurs in 2 phases, 1st being the formation of a series of intermediate products. The temperature employed is all-important, while nickel salts are very effective catalysts for the 1st phase. The partial pressure of the hydrogen in the range investigated—namely, from 100 to 350 atmospheres—had not much influence on the oxidation process. Most of the experiments were carried out with red phosphorus, 3 parts of water by weight being used to each part of phosphorus, but later trials with yellow phosphorus showed the speed of oxidation to be no lower than with the red modification. Compressed hydrogen is contaminated with phosphine, and is best purified by treatment under pressure with steam and copper shavings whereby copper phosphide is formed. The phosphoric acid contains appreciable quantities of phosphorus acid, but when converted into ammonium phosphate the ammonia acts as an oxidation catalyst, with the resultant production of an almost fully oxidized ammonium phosphate. The only metal which gives promise as a constructional material for this purpose on the commercial scale is silver. *J. Pridl. Chim., 1932-33;* Buschmakin, Russakoff, and Frost.

Patents—Industrial Chemicals

Detergent compound forming highly soluble salts. No. 1,962,299. E. F. Drew, N. Y. City.

Moth proofing agent, aryl sulfonic acid amide. No. 1,962,276. J. Huismann & H. Schweitzer, to I. G. F., Frankfort, Germany.

6, 7-diethoxy-I-(3′, 4′-diethoxy-benzyl)-isoquinoline. No. 1,962,224. E. Wolf, Budapest, Hungary.

For making solid ammonium salts. No. 1,962,185. G. Fauser, to Montecatini Soc. Generale Min. ed Agric., Milan, Italy.

Benzoic acid from phthalic acid. No. 1,962 175. H. W. Daudt, to Du Pont & Co., Wilmington, Del.

Mfr. of tetraethyl lead. No. 1,962,173. Calcott, Parmalee & Meschter, to du Pont & Co., Wilmington, Del.

To nitrate quebrachitol. No. 1,962,172. C. E. Burke & R. McGill, to du Pont & Co., Wilmington, Del.

Type of butyric acid as cellulose derivative solvent. No. 1,962,157. G. W. Seymour, to Celanese Corp., N. Y.

Gas ethylene oxide for reducing the nicotine content of tobacco. No. 1,962,145. P. M. Gross & L. F. Dixon, to Hall Tobacco Chem. Co., Jersey City, N. J.

Mfr. of hydroxy carboxylic acids. No. 1,962,140. H. Dreyfus, London, England.

Photographic emulsion with disulfides as antifog agents. No. 1,962,133. L. G. S. Brooker & C. J. Staud, to Eastman Kodak Co., Rochester, N. Y.

Reissue, 19,207; original, 1,950,744. 1929. Olefin-polysulfide plastic in dispersed form. J. C. Patrick, Trenton, N. J.

Trade mark, "CHAMPION," dynamite. No. 350,894. Hercules Powder Co., Wilmington, Del.

Crystalline anhydrous disodium phosphate. No. 1,962,080. K. A. Kilbourne & C. F. Booth, to Swann Res., Inc., Birmingham, Ala.

Process for explosive materials. No. 1,962,065. W. Friederich, Troisdorf, Germany.

Recovery of sulfur from spent gas-purifying masses. No. 1,962,051. J-A. Bordo, to Stahlwerke A. G., Dusseldorf, Germany.

Sulfur & chlorodiphenyls in porous material as composition of strength, electrical insulating power and impermeability. Nos. 1,962,003-5. M. Darrin, to F. N. Burt Company, Limited, Toronto, Ont.

For producing ethers. No. 1,961,987. C. Schumann & H. Ufer, to I. G. F., Frankfort, Germany.

Production of 1.3-butylene glycol. No. 1,961,980. M. Mueller-Cunradi & W. Haag, to I. G. F., Frankfort, Germany.

Production of ketones. No. 1,961,912. W. Querfurth, to G. & S. S. v. Roessler, Frankfort, Germany.

Sodium sulfo-cyanate in flotation process. No. 1,961,899. F. E. Downs, E. L. Martin & E. F. Russell, N. Y. City.

Fractional distillation by use of sharp-edged crystals. No. 1,961,774. T. Midgely, Jr., to Gen. Motors Corp., Detroit, Mich.

Processes for acetic acid from methanol & carbon monoxide. Nos. 1,961,736-8. J. C. Carlin & N. W. Krase, to Tenn. Products Corp., Nashville, Tenn.

For producing phosphates and hydrogen. No. 1,961,691. Ipatiew, Caro & Frank, to Bayerische Stickstoffwerke A. A., Berlin, Germany.

Sulfonation of squalene, an emulsifying agent. No. 1,961,683. Bunbury, Sexton & Stewart, to Imp. Chem. Industries, England.

Corrosion-proof, plastic insulating packing; of soft bitumen & a proto-paraffine earth-oil. No. 1,961,675. P. F. Schade, to Chemieprodukte G.m.b.H., Berlin, Germany.

Metal pickler of an aldehyde, ammonia & carbon bisulfide. No. 1,961,652. D. H. Tompkins, to Rubber Service Labs., Akron, O.

Preparation of hydroxy-ketones. No. 1,961,630. E. C. Britton, to Dow Chem. Co., Midland, Mich.

Ethyl alcohol-sodium & potassium hydroxide fusion, for alkali metal acetates. No. 1,961,625. Strosacker, Kennedy & Pelton, to Dow Chem. Co., Midland, Mich.

Oxidation of alicyclic alcohols & ketones. No. 1,961,623. E. L. Pelton, to Dow Chem. Co., Midland, Mich.

For preparing fluorinated methane. No. 1,961,622. H. S. Nutting & P. S. Petrie, to Dow Chem. Co., Midland, Mich.

Concentration of sodium hydroxide. No. 1,961,590. R. B. MacMullin, to Mathieson Alkali W'ks, N. Y. City.

Carbohydrate-containing vegetable material with a phenol & a mineral acid agent, as a plastic product. No. 1,961,588. L. R. Jones, Petersburg, Va.

Composition of urea in sulfonamid-aldehyde resin. No. 1,961,579. B. C. Bren, to du Pont Viscoloid Co., Wilmington, Del.

Stable hypochlorite composition. No. 1,961,576. M. C. Taylor, Niagara Falls, to Mathieson Alkali Works, Inc., N. Y. City.

Sodium chloride process for cyanides. No. 1,961,569. E. J. Pranke, to Grangers Mfg. Co., Boston, Mass.

Mfr. of acetic anhydride. No. 1,961,542. Jan Al, to De Bataafsche Petroleum Maats., The Hague, Holland.

Kindling briquettes of sawdust, Spanish moss, strainer's dross & rosin. No. 1,961,411. W. D. White & J. A. Prater, Ocala, Fla.

Condensation product from meta-cresol & acetone. No. 1,961,397. Scholler, Jordan & Clerc, to Schering-Kahlbaum, Berlin, Germany.

Separation of fenchyl alcohol, borneol & anethol from pine oil. No. 1,961,398. L. T. Smith, to Hercules Powder Co., Wilmington, Del.

Process & apparatus for separating mixed gases by liquefaction. Nos. 1,961,201-3. W. L. De Baufre, Lincoln, Neb.

Ferrous corrosion inhibitor; sulfite liquor solids in urea synthesis melts. No. 1,961,194. W. S. Calcott, to du Pont & Co., Wilmington, Del.

Sulfonated condensation product of carbohydrates with hydrocarbons & aldehydes. No. 1,961,151. A. O. Jaeger, to The Selden Co., Pittsburgh, Pa.

Monocarboxylic acids and their derivatives. No. 1,961,150. A. O. Jaeger, to The Selden Co., Pittsburgh, Pa.

Non-acid disodium phosphate process. No. 1,961,127. J. H. Coleman, to Warner Chem. Co., N. Y. City.

Reissue; No. 1,611,528; 19,197. Pectin product using salt of strong base & weak acid. E. Jameson, to Cal. Fruit Growers' Exch., Los Angeles, Calif.

Reissue; No. 1,942,812—19,194. Organic products from 7.18-stearic glycol. F. Guenther & K. Saftien, to I. G. F., Frankfort, Germany.

Reissue; reaction on mercaptolic substance with phosphorous sulfide in flotation process. No. 1,812,839:—19,192. I. H. Derby & O. D. Cunningham, to P. C. Reilly, Indianapolis, Ind.

Trade mark, "ALGRAIN," No. 313,775. Denatured grain alcohol. Rossville Comm'l Alc. Corp., N. Y. City.

Mfr. of potassium borate. No. 1,961,073. A. Newman, to Pacific Coast Borax Co., N. Y. City.

Soluble selenite, phosphoric-selenious acid process as magnesium anti-corrosive. No. 1,961,030. G. D. Bengough & L. Whitby, to Imp. Trust for Sci. & Indus. Res., London, England.

Fluoride of beryllium, free from alkali metal fluoride. No .1,960,986. M. Beja, to Cie de Prod. Chim. et Elec. Alais, Paris.

Hydroaromatic hydrocarbons. No. 1,960,977. M. Pier & W. Simon, to I. G. F., Frankfort, Germany.

Liquid oxygen explosive—carbonized lignin residues. No. 1,960,907. G. B. Holderer, to Chile Exploration Co., N. Y. City.

Acoustic plaster—fibrous material, water-soluble gum & oxide-chloride cement. No. 1,960,880. H. C. Smith, to Coast Insulating Co., Los Angeles, Calif.

Alum solution & asphaltic solution in road making. No. 1,960,865. F. L. Carson, to The Pacific Lumber Co., San Francisco, Calif.

Oxygenated aliphatic products from ethylene—alcohol & ether. No. 1,960,633. W. P. Joshua & H. M. Stanley, to The Distillers Co., Ltd., Edinburgh, Scotland.

Coagulating dispersed rubber by anhydrides & halides of lower aliphatic acids. No. 1,960,445. J. McGavack, to Naugatuck Chem. Co., Conn.

Sulfur dioxide-organic beryllium compound in absorptive refrigerating system. No. 1,960,368. H. S. Booth & G. G. Torrey, Cleveland Heights, O.

Filtration of sulfuric acid-hydrocarbon sludges. No. 1,960,348. E. v. Pongratz, to I. G. F., Frankfort, Germany.

To prepare pure hydrogen fluoride. No. 1,960,347. P. Osswald & O. Scherer, to I. G. F., Frankfort, Germany.

Chemico-thermal process for mfr. of alumina. No. 1,960,336. A. Fleischer, to Kalunite Co., Philadelphia.

For N-methyl compounds of the pyridine series. No. 1,960,334. O. Ernst & W. Berndt, to I. G. F., Frankfort, Germany.

Method for mfr. of sulfate of alumina. No. 1,960,320. Est. G. R. Steuart, to Kalunite Co., Del.

Castor oil, toluene alkyl amid, ether of ethylene glycol fluid for pressure apparatus. No. 1,960,298. G. L. Doelling, to Wagner Elec. Corp., St. Louis.

Operating fluid for pressure apparatus, toluene, sulfonamid ester & oils. No. 1,960,295. J. Bebie & G. L. Doelling, to Wagner Elec. Corp., St. Louis.

Acidyl-2.4.6-tribromanilides. No. 1,960,275. B. E. M. Miller, England, to Celanese Corp., N. Y. City.

Moistureproofing composition, diphenyls and wax. No. 1,960,266. R. L. Jenkins, to Swann Res., Inc., Birmingham, Ala.

Thermoplastic adhesive of chlorinated polyphenyls. No. 1,960,265. R. L. Jenkins, to Swann Res., Inc., Birmingham, Ala.

Resin by condensing a mercaptan with compound of aldehydes or ketones. No. 1,960,262. C. Dreyfuss & G. Schneider, to Celanese Corp., N. Y. City.

Trade mark renewed, for cyanide salts. No. 97,782. R. & H. Chem. Co., to du Pont & Co., Wilmington, Del.

Trade mark, No. 348,837. "Rossville—The Spirit of the Nation—Alcohol." Rossville Comm'l Alcohol Corp., N. Y. City.

Disclaimer, No. 1,858,640. Amine hydrohalides. M. E. Putnam, to Dow Chem. Co., Midland, Mich.

Disclaimer, No. 1,783,167—as to castor oil in part of specification. H. A. Bruson, to Resinous Products & Chem. Co., Philadelphia, Pa.

Glycol ester, polybasic acid & drying oil acids for coating material. No. 1,960,220. H. H. Hopkins, to du Pont & Co., Wilmington, Del.

Adipic acid and its beta-alkyl substituted derivatives. No. 1,960,211. R. P. Perkins & A. J. Dietzler, to Dow Chem. Co., Midland, Mich.

Formula for waterproofing composition. No. 1,960,209. W. L. Holter, to Van Schaack Bros., Chicago.

Process for preparing thiazoles. No. 1,960,205. R. F. Dunbrook, to Firestone Tire & Rubber Co., Akron, O.

Process for carbonaceous hydrogenation. No. 1,960,204. G. H. B. Davis, Baton Rouge, to Standard I. G. Co., Wilmington, Del.

Gelatine dispersant with one of 10 reagents, for making bituminous dispersions. No. 1,960,115. Z. C. Loebel, to The Patent & Licensing Corp., N. Y. City.

Unflocculated dispersion of a pitchy base in an aqueous vehicle. No. 1,960,112. L. Kirschbraun & H. L. Levin, to The Patent & Licensing Corp., N. Y. City.

Sodium silicate impregnation of red cedar shingles followed with ammonium sulfate solution to render non-inflammable. No. 1,959,966. P. Robinson, Boston, Mass.

Organic arsenic or antimony seleno compound. No. 1,959,958. M. S. Kharasch, Chicago, Ill.

Hydroxy-alkyl ethers of polyhydric alcohols. No. 1,959,930. O. Schmidt & E. Meyer, to I. G. F., Frankfort, Germany.

Catalytic production of vinyl ethers from non-explosive hydrocarbon-alcohol mixtures. No. 1,959,927. W. Reppe, to I. G. F., Frankfort, Germany.

Chem. and physical action under superatmospheric pressure in carbonaceous hydrogenation. No. 1,959,924. M. Mueller-Cunradi, O. Eisenhut & H. Schilling, Ger., to Standard-I. G. Co., Linden, N. J.

Production of phthalic anhydride. No. 1,959,898. Est. J. Brode & A. Johannsen, to I. G. F., Frankfort, Germany. Original appl., 1929.

Sulfonated fatty glyceride, inorganic alkaline earth salt & solvent for treating water-in-oil emulsions. No. 1,959,824. A. M. Herbsman, to Indus. Patents, L'td, Los Angeles, Calif.

Acetone, methyl alcohol et al treatments of extracting enzymes from various fruits. No. 1,959,750. C. Wada, to M. Masuda, Tokyo, Japan.

Precipitated hydrated silica, opaque in oil vehicles. No. 1,959,749. S. S. Svendsen, to Clay Reduction Co., Chicago, Ill.

Hydrated silica by contact between silicon-diamminotetrafluoride & an aqueous liquid. No. 1,959,748. S. S. Svendsen, to Clay Production Co., Chicago, Ill.

Ammonium fluoride precipitation of silica from oxides of metals. No. 1,959,747. S. S. Svendsen, to Clay Reduction Co., Chicago, Ill.

Linseed oil, China wood oil & solvent in mfr. of a brake lining. No. 1,959,686. W. Nanfeldt, to World Bestos Corp., Paterson, N. J.

Insulating cement—mineral wool, diatomaceous earth & an alkaline hydroxide. No. 1,959,658. H. N. Clark, Bound Brook, N. J.

Fatty acid esters from starch, dextrin & sugar. No. 1,959,590. E. J. Lorand, to Hercules Powder Co., Wilmington, Del.

Extraction of acetic acid from pyroligneous substances. No. 1,959,547. E. Ricard & H. M. Guinot, to S'te Anon; Usines de Melle, France.

Hydrazine by alkali metal hypochlorite on urea. No. 1,959,503. O. Seuffert & E. Ihwe, Darmstadt, Germany.

Production of nitrate of lime through high temperature action on nitrous vapors of quicklime. No. 1,959,480. Appl. 1931. G. L. des Ylouses, Boulogne, to L'Azote Francais.

Viscous oils as emulsifiers. No. 1,959,478. Appl. 1930. K. Keller, Ger., to General Aniline W'ks, N. Y. City.

Sulfuric acid-ferrous sulfate process for purifying mineral raw materials. No. 1,959,448. R. Staufer & K. Konopicky, Vienna, to Alterra A. G. of Luxemburg.

Water-soluble resins of phenol formaldehyde group. No. 1,959,433. E. C. Loetscher, Dubuque, Ia.

Polymerization of unsaturated hydrocarbons. No. 1,959,343. W. S. Calcott & A. S. Carter, to du Pont & Co., Wilmington, Del.

Trade mark, caustic soda. No. 313,328. John Heinzell, Jr., Heinzell Soap W'ks, Appleton, Wisc.

Trade mark, for water-repellant finish for textiles, leather, paper, etc. No. 313,213. Sandoz Chem. W'ks, N. Y. City.

Trade mark, "BRESIN," for resin. No. 349,322. To Hercules Powder Co., Wilmington, Del.

Dialkyl resorcinols. Patentees held not first inventors. No. 1,897,188. On claim 1.

Reaction of a chlorketone & a phenol, in hydrochloric acid forming resin, coating & plastic composition. No. 1,958,488. W. H. Moss, to Celanese Corp., N. Y. City.

Rosin size emulsion with free rosin. No. 1,958,470. J. A. De Cew, Mount Vernon, N. Y.

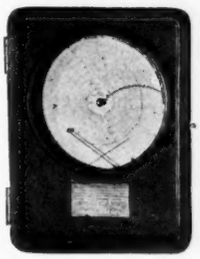
New Equipment

A new boiler unit has been designed to provide a completely coordinated unit comprising a 2-drum boiler, a water-cooled furnace, burners for liquid, gaseous, or pulverized solid fuels, and, when needed, a superheater, economizer, and an air heater. This unit is particularly applicable in industrial plants where operation at high nominal ratings with high final steam temperatures, and where high efficiency is desired. Arrangement of the boiler proper, with inclined tubes entering an upper and a lower drum, and with the furnace paralleling the drums and separated from the rows of tubes by a furnace wall, instead of the conventional arrangement of boiler set over furnace, makes its installation advantageous where headroom is limited.

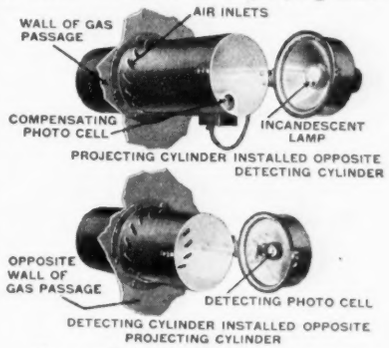
Large furnace volume required for pulverized-coal firing of other types of boilers of the same capacities as the integral-furnace boiler, but with refractory-lined furnaces, has penalized this method of firing more than it has any other in first cost, operation, and maintenance. This new unit removes this handicap, since water-cooled furnace walls can be applied to this boiler at a fraction of the cost for applying this construction to conventional boilers of the same capacities. **QC 146**

Smoke Density Recorder

A new photo cell smoke density recorder compensated for variations in light source intensity and operated by the galvatron electronic relay circuit has been announced. This equipment consists of a receiving element in the form of an attractive recorder which is usually mounted on the individual boiler panel board and a transmitting element consisting of a projecting cylinder and a detecting cylinder which are mounted on opposite sides of the breeching or flue gas passage. A continuous record of relative smoke density is made by the recorder on a 12-inch uniformly graduated recording chart. This record clearly indicates stack conditions at all times, night and day, showing definitely each period of tube blowing. A hinged panel within the dust-proof pressed steel recorder casing provides the chart plate on one side and on the other side an easily accessible mounting for the sensitive galvanometer and electronic relays of the galvatron. It will be noted from the accompanying illustration that 2 photo cells are employed in the transmitting element, one in the projecting cylinder and the other in the detecting cylinder. Full luminous flux from the incandescent lamp light source is received by the compensating cell at all times regardless of the smoke density condition within the gas passage. However, the photo cell located in the detecting cylinder on the opposite side of the gas passage receives light of varying intensities, depending upon the density of the smoke in the passage. Both cells consist of a thin metallic disk covered with light sensitive material which develops a current proportional to the intensity of illumination. **QC 147**



Recording galvatron for smoke density.



Transmitting element of the new density recorder.

GYPSTEEL PLANK NEWS

Published by STRUCTURAL GYPSUM CORPORATION
30 Rockefeller Plaza, New York, N. Y.

HANDLES LIKE LUMBER

Gypsteel Gypsum Plank* can be cut, sawed, nailed or bored

Cuts costs 7 ways

ENDS DELAYS. Gypsteel PLANK floors have no joints to grout . . . no waiting for the slab to "set" . . . no forms to remove. You can work over them as soon as laid.

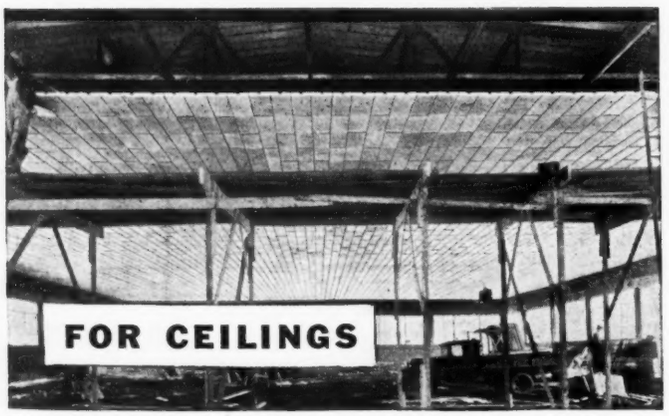
SAVE TIME, SAVE MONEY on all fireproof construction. Gypsteel Gypsum Plank simplifies planning. Handles like lumber. Eliminates water. Requires no form work. Is light, strong, incombustible, vermin-proof, termite-proof.

What It Is **— Gypsteel Gypsum Plank is a solid slab of factory-cast dense gypsum, tongued and grooved on sides and ends with galvanized, copper-bearing steel. Always available in standard sizes for immediate delivery. Used successfully by architects everywhere—for floors, roofs, partitions, ceilings. Send for free bulletin giving full details and valuable facts about floor loads, installation, etc. Address Structural Gypsum Corporation, 30 Rockefeller Plaza, New York.**

EASY TO USE. No detailed specifications needed with Gypsteel PLANK. It's light, dry, clean. And can be cut, sawed, nailed or bored as readily as lumber.

ACOUSTICAL FEATURE AT HUGE SAVING

Special Acoustical Plank now available for combination roof-ceiling construction in drill halls, armories, gymnasiums, industrial buildings, etc. This Plank has an average efficiency of 48% sound absorption. Your choice of 8 colors. And the cost is amazingly low. Get the details today on Acoustical Plank.



FULL FIREPROOF RATING. Gypsteel PLANK gives flat ceiling construction with maximum fire protection to supporting steel. Especially recommended for ceilings in garages, auditoriums, theatres, etc. Saves heat loss, lowers insurance costs.

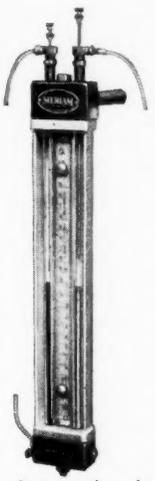
PRACTICALLY ELIMINATES WATER. Speeds construction. Note how easy Gypsteel PLANK handles. Always ready to use. Made to order to reach from floor to ceiling up to 9-foot heights.

Lining Turpentine Barrels With Glue

A newcomer in the turpentine industry is a machine for lining barrels with glue. This work previously done by hand, was accomplished by pouring heated glue into the barrel, rolling it around until all sides were coated and then pouring out the remainder of the glue through the bung. Needless to say, this was a tedious and somewhat hazardous process with the conventional 55-gallon barrel used for turpentine shipments. **QC 148**

Manometer With New Features

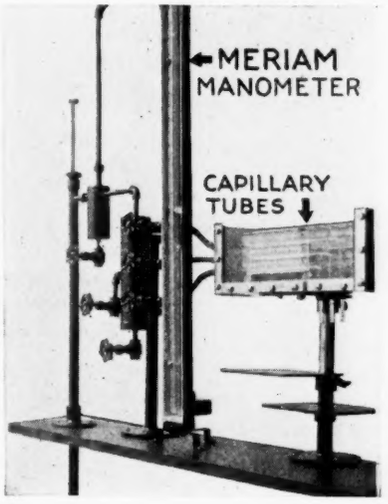
A new type of manometer fitted with automatic electric control features is now available. New instrument is stated to be unusually rugged and simple, and to remain permanently accurate under severe conditions. It is adaptable to a wide variety of direct and differential control uses for pumps, liquid levels in tanks and sprinkler systems, and for maintaining gas pressure and flow between close limits; or for starting and stopping the flow in 2 pipes alternately for special purposes. Other uses suggested are the automatic starting of a reserve pump in case of a failure of the regular unit to operate, the production of alternate pressure and vacuum in a closed vessel, or for electrically operated remote control of steam valves, etc. It has the additional advantage of providing a visible reading of performance at all times. In the type illustrated, 2 separate glass tubes are used instead of the usual U-tube. These two tubes are gasketed at their lower ends into an iron block which is drilled so as to provide the U-connection between them. Three terminals are provided—one on the block and the other 2 at the respective upper ends of the tubes. These latter terminals are connected to non-corroding adjustable tungsten wires which pass through the Bakelite plugs in the upper ends of the tubes, and which may be set so that either of them contact with the mercury at the predetermined differential pressure or vacuum. **QC 149**



Automatic electric manometer-regulator.

Simple Method in Testing Viscosity

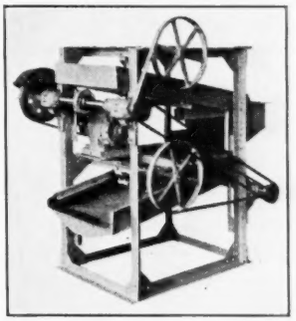
An unusual use for manometers is reported in connection with a new device designed by Glidden (paints, varnishes and lacquers). Equipment, which may be made portable, enables the "body" or viscosity of such materials to be readily determined without the need for more than a very small test quantity. Small vials or test tubes of the materials to be tested are first placed in a pump-circulated oil bath till they attain a predetermined temperature. Each in turn is then connected to a standard capillary suction tube which is maintained at a constant degree of vacuum by means of the manometer already mentioned—this type of instrument being chosen mainly because of its ruggedness and permanent accuracy under practical working conditions. As the paint or varnish is drawn up the tube, a careful note is taken of the time required for the head of the column to pass from one scale mark to another about 6 inches along the tube. This affords a measure of the viscosity, which in turn indicates the "spreading capacity." Three standard capillary tubes are provided so that materials of widely differing viscosities, such as paints or lacquers, may be quickly tested. Glidden Co. states that it has 2 of these devices, one at its Nubian plant at Chicago and the other at the Cleveland plant. It is also stated that the new method of testing "body" is not only quicker but more accurate than the usual tests. **QC 150**



Manometer and capillary tube equipment used for testing "body" or viscosity of paints, varnishes and lacquers.

Grading and Separating

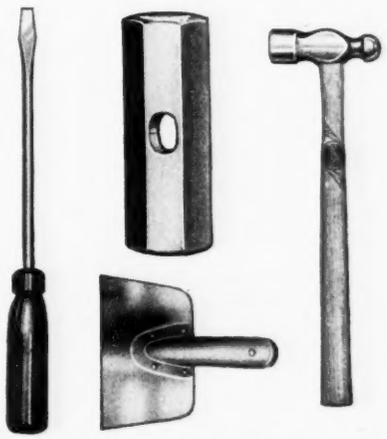
Illustration shows a new variable pitch grader and separator. It is a double deck, eccentric driven, shaking screen, provided with a self-contained motor drive. Each screen is provided with a knocking device to keep screen clean. Extra screen supports to change the pitch of the screen to 3 different angles—namely, 10, 12 and 18 degrees, are part of the regular equipment. It is fireproof, rugged, all steel construction, easy to keep clean, light running and economical in space. Recommended for cleaning and grading free flowing granular materials. **QC 151**



Grader and separator with variable pitch screens.

Non-Sparking Tools

Lacquering plants, producers and processors of cellulose nitrate, oil companies, etc., and all other industries confronted with explosion and fire hazards in their production and maintenance work will be interested in the new line of non-sparking tools recently announced. Made of wrought beryllium copper these new tools are non-magnetic and non-sparking and by actual test they are almost as durable as steel tools of similar design and size. Non-Sparking Tools have long been available but this new line is the first one in which absolute safety has been achieved with practically no sacrifice in the work value of the tools. **QC 152**



Non-sparking tools to reduce fire and explosion hazards.

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive more detailed information on the following: (Kindly check those desired).

QC 146	QC 149
" 147	" 150
" 148	" 151
	" 152

Name .....

Title .....

Address .....

Equip. July

Plant Operation

Fundamentals of gas exsorption (reverse process of absorption) have been studied by Prof. Dr. A. Guyer and Dr. B. Tobler, Zurich Technical High School. In the course of their work authors made use of an "Evasionskoeffizient," which is defined as follows: "The apparent 'Evasionskoeffizient' is that quantity of gas in milligrams which is given up from 1 sq. cent. of solution surface to the atmosphere when concentration of the gas in the solution is one gram per 1,000 c.c. and the partial pressure of the gas in the atmosphere is practically nil." Experiments are not yet completed, but the provisional conclusions ("Die Chemische Fabrik," May 2, '34) are as follows:

Dominant factor in exsorption of gases from solution is supersaturation of the latter in respect to the gas. Owing to existence of supersaturation, complete elimination of the gases cannot be obtained by atmospheric pressure reduction alone, and a combination of pressure reduction with thermal or mechanical processes is in practice essential. In the speed of exsorption of gases, which are practically purely physically dissolved in water, diffusion of the gases to the surface of the solution is the principal factor. Technically, therefore, those processes are practicable in which the diffusion is aided by such mechanical devices as spraying the liquid. Where the gas exists in aqueous solution in more or less dissociated form, however, degree of dissociation is the dominant factor; and in the removal of the gases from such solutions, not only is fine spraying necessary but adjustment in the temperature and the acidity of the solution is also necessary. Work is now being carried out on the actual quantitative influence of the spray particle size of a solution on the speed of the exsorption of its dissolved gas. Experimental work has been carried out with carbon dioxide, sulfur dioxide, ammonia and acetylene. *Chemical Trade Journal* (London), May 11, '34.

Ammonium Bicarbonate as a Fertilizer

Greater stability of ammonium bicarbonate can be obtained (thereby increasing its possibilities of use as a fertilizer) by addition of a mixture of hydrocarbons of high boiling point, with waxes, fats, or resins. Additions of such materials as calcium chloride, calcium sulfate, ammonium chloride, and ammonium sulfate, increases resistance of granules to fracture.

Sulfur Dichloride From Pyrites

Recent investigations show possibilities of sulfur dichloride production directly from pyrites. Reaction is quantitative when an excess of chlorine is passed over a finely powdered and perfectly dry layer of pyrites at 130-140° C. (yield is 96% of theoretical). By direct chlorination of arsenic sulfides (realgar and orpiment) there is obtained a mixture of arsenic trichloride and sulfur dichloride, easily separated by fractional distillation. Yield of arsenic trichloride is 99%, and that of sulfur dichloride 96%. Ionescu and Soare *(Bull. Soc. Roumaine de Chimie,* '32, p. 25).

Patents—Fine Chemical

Basic derivatives of 9-amino-acridines. No. 1,962,277. H. Jensch & O. Eislib, Ger., to Winthrop Chem. Co., N. Y.

Photographic emulsion containing 8-substituted oxacarbocyanines. No. 1,962,124. L. G. S. Brooker, to Eastman Kodak Co., Rochester, N. Y.

Photographic emulsion containing dibenzoxacarbocyanines. No. 1, 962,123. L. G. S. Brooker, to Eastman Kodak Co., Rochester, N. Y.

Isolation of piperitone from essential oils. No. 1,960,134. J. W. Blagden, W. E. Huggett and Howard & Sons, Limited, England.

1-pheny-2-methylbenzylaminopropanol-1. No. 1,959,393. F. Stolz & F. Flaecher, Ger., to Winthrop Chem. Co., N. Y. City.

N-substituted phenyl alkylol amines. No. 1,959,392. F. Stolz & F. Flaecher, Ger., to Winthrop Chem. Co., N. Y. City.

Trade mark renewed. Zinc stearate. No. 97,993. Merck & Co., Inc., Rahway, N. J.

Claims 1 & 2 held valid & infringed. No. 1,370,865. Mallinckrodt Chem. W'ks vs. E. R. Squibb & Sons. Mo.

Basic product from imino ethers of higher fatty acids. No. 1,958,529. M. Bockmuhl & R. Knoll, Ger., to Winthrop Chem. Co., N. Y. City.

Coal Tar Chemicals

Concordia Colliery, of Oberhausen, Germany, is operating a dry process for desulfurization of coke-oven gas which makes but a small demand on space and offers a convenient method for the isolation of crude sulfur. It is based upon the use of specially prepared ferric hydroxide spheres of 15 to 20 mm. diameter, possessing great mechanical strength and a comparatively high porosity (equivalent to about 60% by volume).—*Chemiker Zeitung.*

Patents—Coal Tar Chemicals

Azo dyes. No. 1,962,226. H. E. Woodward, to du Pont & Co., Wilmington, Del.

Dry, stable tetrazomonoazo compounds. No. 1,962,111. H. Bamberger, to Sandoz Chem. W'ks, Basel, Switzerland.

Intermediates & dyestuffs of the anthraquinone series. Nos. 1,962,083-4. Nawiasky, Stein & Vilsmeier, Ger., to General Aniline W'ks, Inc., N. Y. City.

Phenols from halogenated hydrocarbons. No. 1,961,834. F. A. Steingroever & R. Zellmann, to Chem. Fabrik von Heyden, Radebuel, Germany.

Yellowish to olive-brown indigoid vat dyes. No. 1,961,628. W. Zerweck & W. Hechtenberg, Ger., to General Aniline W'ks, N. Y. City.

Water-insoluble mono-azo-dyestuffs. No. 1,961,519. L. Laska & A. Zitscher, Ger., to General Aniline W'ks, N. Y. City.

Recovery of phenols from phenol-carrying distillation gas and the like. No. 1,961,165. W. Prahl, to Dr. F. Raschig G.m.b.H., Ludwigshafen, Germany.

2-methylaminobenzene-1-carboxylic acid-4-sulfonic acid. No. 1,960,644. A. Ossenbeck & E. Tietze, Ger., to General Aniline W'ks, N. Y. City.

Compound of the anthraquinone series. No. 1,960,564. K. Zahn & W. Schultheis, Ger., to General Aniline W'ks, N. Y. City.

Halogenated dibenzanthrones. No. 1,960,540. Kunz, Koeberle & Berthold, Germany, to General Aniline W'ks, N. Y. City.

Anthracene intermediates. No. 1,960,375. S. Gassner & W. Meiser, to General Aniline W'ks, N. Y. City.

Dyes of the azine series. No. 1,960,351. O. Eeibert & W. Benade, Ger., to General Aniline W'ks, N. Y. City.

Production of anthraquinone coloring matters. No. 1,960,233. Crowell, Ogilvie & Rogers, to Nat'l Anil. & Chem. Co., N. Y. City.

Trade mark, for coal-tar dyes soluble in alcohol. No. 313,471. du Pont & Co., Wilmington, Del.

Trade mark, No. 349,383. "SANDOZ," since 1894, for products of Sandoz Chem. W'ks, N. Y. City.

Vat dyestuffs from perylene diketones. No. 1,960,186. G. Matscher, to F. Bensa, Genoa, Italy.

Anti-diazo-sulfonate dyes. No. 1,959,995. A. Zitscher & W. Seidenfaden, to General Aniline W'ks, N. Y. City.

Metalliferous azo-dyestuffs. No. 1,959,844. F. Straub & H. Mayer, to S'te Chem. Ind., Basel, Switzerland.

Disazo dyestuffs. No. 1,959,733. G. Niemann, Ger., to General Aniline W'ks, N. Y. City.

Dibenzopyrene-quinone vat dyes. No. 1,959,679. Appl. 1929. Kunz, Kraenzlein, Koeberle, Corell, Berthold & Vollmann, Ger., to General Aniline W'ks, N. Y. City.

Yellow-orange-red-brown dyestuffs containing chromium. No. 1,959,507. F. Straub & W. Widmer, to Soc. of Chem. Ind., Basel, Switzerland.

Indigoid dyestuffs. No. 1,959,474. Appl. 1928. E. Hoffa & H. Heyna, Ger., to General Aniline W'ks, N. Y. City.

Symmetrically substituted azobenzene compounds. No. 1,959,461. D. Delfs, Ger., to General Aniline W'ks, N. Y. City.

Diaminotriarylmethane dyes. No. 1,959,455. O. Boger & O. Meissner, Ger., to General Aniline W'ks, N. Y. City.

Reaction process to make phthaloyl-phenanthridones. No. 1,957,593. R. M. Heidenreich & P. Tust, Ger., to Gen. Anil. W'ks, N. Y. City.

Azo dyestuffs containing copper. No. 1,957,580. D. Delfs, & R. Knoche, Ger., to Gen. Anil. W'ks, N. Y. City.

Olive to black water-insoluble azo dyestuffs. No. 1,957,572. A. Zitscher, Ger., to Gen. Anil. W'ks, N. Y. City.

Improved dibenzanthrone. No. 1,957,547. R. N. Luick, to du Pont & Co., Wilmington, Del.

Patents—Chemical Apparatus

Chemical dryer. No. 1,960,123. J. Roberts, to Proctor & Schwartz, Inc., Phila.

Gov. Publications

A digest of federal government publications and other booklets from various sources of interest to the chemical and process industries.

Codes of Fair Competition as approved for the: Agricultural Insecticide and Fungicide Industry, Code 275, supplement No. 1. Registry No. 615-02.; Carbon Dioxide Industry, Code No. 275, supplement No. 2. Registry No. 699-20; each 5c*.

Changes in Composition of American Fertilizers, 1880-1932. Agricultural Circular 315, 20 pages. 5c*.

Liquid Sulfur Dioxide As a Fumigant For Ships. Public Health Service, Reprint, No. 1615, 17 pages, illustrated. Covers advantages, methods, apparatus, costs, and experimental tests of liquid sulfur dioxide. 5c*.

Coal (Detailed Statistics. Statistical appendix to Minerals Yearbook, '32-'33. Pages 373-454. Gives the production, number and size of mines, labor statistics, distribution of employment, equipment and methods of mining and preparation, consumption, stocks, and distribution, imports and exports, world production, etc. 10c*.

Errors In Gas Analysis arising from loss of gas by solution in rubber connections and stopcock lubricant. Standard Research paper, Bureau of Standards, Paper 661. 5c*.

Method for the separation of ruthenium from platinum, palladium, rhodium, and iridium. Bureau of Standards, Research Paper 654. A

procedure for the separation and gravimetric determination of ruthenium is described. 5c*.

Coke And By-product Tables, 1933. These tables give the final statistics of production of by-product and beehive coke in the calendar year 1933. Dept. of the Interior, Bureau of Mines, Washington.

Calcium Chloride—a review by Paul M. Tyler of the Bureau of Mines, Information Circular 6781. Washington, D. C.

Greensand—a review by Paul M. Tyler, Bureau of Mines, Information Circular 6782. Washington, D. C.

Production and Sales of Dyes and Other Synthetic Organic Chemicals, 1933. U. S. Tariff Commission, Washington, D. C.

The Occurrence of Gases In Coals by R. F. Selden, Report of Investigations 3233, Bureau of Mines, Washington, D. C.

Note: Where a price is given for Federal Government publications requests should be sent to the Supt. of Documents, Washington. Remittances should be made by postal money order, express order, coupons or check. Postage stamps, foreign money, are not accepted. Currency may be sent at sender's risk.

Equipment Company News

Foster Wheeler has acquired exclusive rights in the U. S. and Canada for the sale and manufacture of the Ruths Steam Storage Systems. Ruths System is a means of storing steam during periods of light demand for use in periods of heavy demand. . . . Noteworthy among the industrial exhibits at this year's Century of Progress Exposition is that of Link-Belt, Chicago, in the General Exhibits Bldg., where the company's mechanical materials handling machinery and positive power transmitting equipment are portrayed in beautiful colored illuminated glass pictures; in working models that hold the attention of young and old; in dioramas; and in actual machinery units, a number of which can be operated with ample opportunity to observe how each mechanism works. . . Link-Belt has opened a Dallas, Tex., warehouse at 413 2nd ave. . . Linde Air Products has announced a new Oxweld generator intended for portable service only.

Link-Belt's elaborate Century of Progress display.

Chemical Equipment Code Signed

Code for the chemical equipment industry (Registry No. 1614-01) was signed July 5 and becomes effective 10 days following that date. Code is supplement to the basic code for the machinery and allied products industry (the so-called "MAPI," which code was approved Mar. 17) see CHEMICAL INDUSTRIES, June, '34, p. 538. Code authority for the chemical equipment industry consists of the directors of the Chemical Engineering Equipment Institute (headed by J. V. N. Dorr) plus 2 outside representatives yet to be chosen. G. H. Barber, of the NRA staff, is temporarily administration member. D. H. Killeffer is the Institute Secretary, Chemists' Club Bldg., N. Y. City.

Equipment Booklets

E177. Ajax Electrothermic Corp., Trenton, N. J. New 4-page leaflet describes an entirely new product of this company—the induction oven. Lacquer users particularly will find this booklet interesting, but this is merely one of many possible applications.

E178. Alco Products, Inc., Division of American Locomotive Co., 30 Church st., N. Y. City. Chemical consultants, plant superintendents, etc., will find this splendidly illustrated booklet most interesting showing several examples of process equipment fabricated by Alco. You are personally conducted through the Alco plant in a series of photographs depicting the progress of a plate through the various stages of manufacture until the final pipe emerges.

E179. Aluminum Co. of America, Pittsburgh, Pa. Every chemical engineer, consultant, plant manager or superintendent, or chemical or process industry manufacturer should have on file a copy of "Combating Chemical Corrosion with Alcoa Aluminum." It most certainly belongs in every reference library.

E180. Babcock & Wilcox Co., 85 Liberty st., N. Y. City. Details of the design and construction of the B. & W. integral-furnace boiler, as well as operating characteristics of several installations are contained in a new 20-page fully-illustrated booklet. This new unit includes boiler, superheater, water-cooled furnace, and fuel burning and control equipment, and will utilize pulverized coal, oil, or gas fired singly, or in any combination.

E181. Bantam Ball Bearing Co., South Bend, Ind. New catalog on Bantam tapered roller bearings just published combines conciseness with a very thorough treatment of load carrying capacities and other pertinent information. Every effort was made to give complete and accurate information on true load carrying capacities without confusing the issue with complicated and long drawn out calculations.

E182. General Electric Co., Schenectady, N. Y. A new 80-page reference book on "How to Select Insulated Cable" has been published by G. E. Designated as BEA-1837, publication covers cable for the transmission and distribution of electric power at normal frequencies, and presents in convenient form information that is required in determining the cable best adapted for a particular installation.

E183. General Electric Co. This booklet describes briefly a few of the hundreds of cases where the installation of GE power-factor improvement equipment—capacitors, synchronous motors, and synchronous condensers—has improved plant operation and effected savings. In these cases, where power contracts included a penalty for low power-factor and a bonus for power-factor improvement, a substantial return was made on the investment.

E184. General Electric Co., Plastics Dept., Pittsfield, Mass. Booklet GEA-1658A gives specifications and complete technical data on Textolite roll-neck bearings.

E185. Hauck Manufacturing Co., 126 10th st., Brooklyn. A new 4-page leaflet describes new micro regulating valves for regulating oil flow to burners for industrial heating processes and for controlling flow of liquids. There are many places in the chemical and process industries where these valves will prove valuable.

E186. LaMotte Chemical Products Co., 414 Light st., Baltimore, Md. New LaMotte supplementary catalog is ready for distribution. It gives illustrated information on new units such as pH Control of detergent solutions; determining chlorine in strong bleach; determining chromate concentration in refrigerating brines; boiler feed water tests; LaMotte titration flask; combination swimming pool water outfit; new utilities block comparitor; combination soil testing outfits, and many others.

E.187. Linde Air Products Co., 205 E. 42d st., N. Y. City. With the rapidly increasing use of corrosion-resisting alloy steels has come the problem of fabricating these alloys by modern methods, one of the most important of which is the oxy-acetylene welding process. Extensive research has been carried out on the subject in recent years not only by the makers of these steels but by the oxy-acetylene industry. Recommended practices for oxwelding corrosion-resisting steels, based on the comprehensive investigations of Union Carbide and Carbon Research Laboratories, Inc., are given in this booklet. The currently-used chromium steels have certain idiosyncrasies depending on the varying proportions in the steel not only of chromium but of other alloying agents which affect the material's weldability. For this reason in this booklet stainless steels are divided into 8 groups, each group having similar welding properties. For each group there is a detailed discussion on welding procedures as well as treatment before and after welding where this is necessary.

E188. Linde Air Products Co. This interesting booklet consolidates and crystallizes current ideas on how to design jigs and fixtures for welding, whether it be production fabrication or repair work.

E189. Linde Air Products Co. By reason of recent importance advances in the use of the oxy-acetylene bronze-welding process, Linde Air has found it necessary to bring out a new edition of its valuable 8-page pamphlet entitled, "The Progress of Bronze-Welding." Similar in form to previous editions, it contains a comprehensive and instructive story of bronze-welding in all its phases.

E190. Linde Air Products Co. "The Testing and Qualification of Welders" is a title that speaks for itself.

E191. Link-Belt Co., 910 S. Michigan ave., Chicago. A new 32-page illustrated catalog No. 1415, with horse power and other engineering data, dimensions, diagrams, etc., has recently been issued. Book covers single, double and triple reduction units of herringbone gear type; also a full line of flexible couplings.

E192. Pangborn Corporation, of Hagerstown, Md., has just issued a new 24-page bulletin on their Type "CH" all metal, cloth screen, dust collector. This is one of the most complete catalogs published to describe and illustrate the many exclusive and new features not previously available in this class of equipment. Many large photographs, charts and drawings clearly illustrate the 14 outstanding points of superiority claimed for this new collector.

E193. The Patterson Foundry & Machine Co., East Liverpool, Ohio. A 4-page leaflet describes a new acid-proof sanitary mixer for laboratory and small process work.

E194. Roots-Connersville Blower Corp., Connersville, Ind. Single-stage centrifugal blowers and exhausters are described in bulletin 120-B10, just published. While bulletin referred to covers only the single-stage units, company also manufactures a complete line of multi-stage equipment. A table lists capacities up to 8000 CFM at pressures up to 3 lbs., but information regarding larger capacities and higher pressures is readily available upon request.

E195. The Stanley Rule & Level Plant (The Stanley Wks) New Britain, Conn. A 4-page leaflet describes beryllium copper non-sparking tools.

E196. Surface Combustion Corp., Toledo. A 4-page circular reviews and illustrates a number of installations of SC standard heat-treating furnaces.

E197. Worthington Pump & Machinery Corp., Harrison, N. J. Circular W-321-B2 describes in detail Worthington Monbloc centrifugal pumps.

Container and Packaging Bulletins

E198. Master Package Corp., Owen, Wisc. A new 4-page circular tells how to reduce shipping costs of dry bulk products with the "All-fibre" drum.

E199. Anchor Cap & Closure Corp., Long Island City. A new leaflet lists 6 important reasons why Anchor C. T. B. caps are finer screw caps.

E200. Arkell Safety Bag Co., has prepared a most interesting 4-page leaflet relating the story of 75 years of pioneering in the application of paper to shipping containers.

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive the following booklets specify by number. .....

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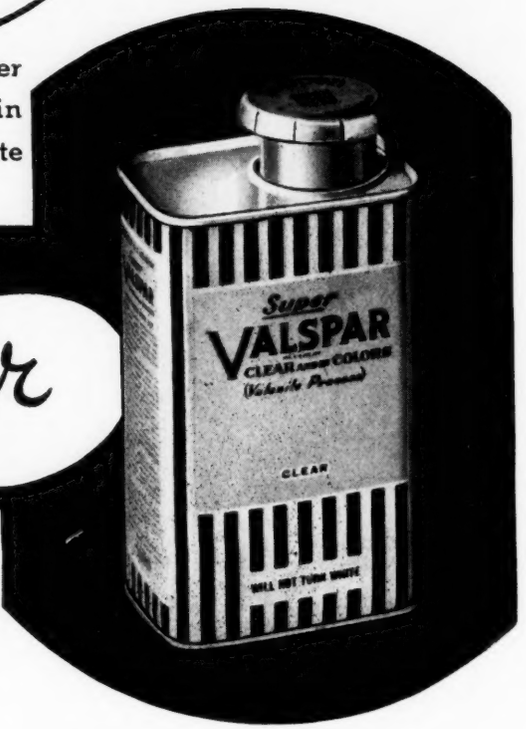
Name .....
Title .....
Company .....
Address .....
Equip.-Container-July

Before

● A good, practical container ... but just a bit lacking in eye appeal, a shade too ornate and, yes, commonplace!



After

● Same fine varnish in a grand new suit!

A container that does more than *package* the product ... that **SELLS!**

Lift it out of the Commonplace

AND *BREAK DOWN* THE FIRST LINE OF SALES RESISTANCE

THE CREATION of "packaging to sell" has been the business of the Continental Can Company for 29 years—developing original designs more satisfactory from the standpoints of sales, utility, convenience and economy. Continental research includes *all* the functions of a container.

Do you have a packaging problem? Are you satisfied that your present package does not lack sales appeal? Do competitive products have a packaging advantage? Is your product properly protected—easily accessible?

Whatever the question: we suggest that you write, wire or phone for a practical demonstration of our development service.

"It's Better Packed in Tin"

CONTINENTAL CAN COMPANY

NEW YORK CHICAGO SAN FRANCISCO

Chemical Markets & News

American Potash & Chemical Issues Then Withdraws Potash Prices As Other Factors Fail To Release '34-'35 Schedules—Market In State of Uncertainty

The last 30 days have brought out in the open rumors about potash that have been growing louder in the last 6 months. Entrance of the Spanish and Russian producers into this market in the last fertilizer season brought about an inevitable weakness in the price structure. American Potash & Chemical (Trona potash) on June 1 issued a circular letter to the trade announcing drastic price reductions (approximately 26% below the corresponding '33 figures and approximately 18½% below the interim announcement made May 1). See CHEMICAL INDUSTRIES, June, '34, p 551. Other domestic producers and the German-French representatives failed, however, to make similar announcements, but from reliable sources CHEMICAL INDUSTRIES learned that the possibilities were that $35 a ton less 12% for sulface of potash and $22.50 less the same discount for magnesia potassium sulfate would be the prevailing prices for the new season. Withholding published prices and other factors created uneasiness among buyers, and it is believed that little material actually changed hands in June. On the 26th American Potash addressed the following letter to the fertilizer trade:

"We hereby withdraw and cancel, effective this date, our circular addressed to producers of fertilizers, dated June 1st, 1934.

"The circular of June 1st, 1934, was issued for the purpose of indicating this Company's general conception of the levels of potash for the 1934-1935 season, with the thought that our customers were entitled to know in advance the general price level which would probably prevail. It was expected that other potash producers would likewise announce their prices in accordance with long prevailing custom. No such announcements have been forthcoming. Under these circumstances this Company is compelled to withdraw the schedule of prices and terms referred to.

"We regret the necessity for this action but we shall be pleased to negotiate for your potash requirements for the coming season and shall appreciate your continued patronage."

At the moment prices officially are nominal, but the market is firm at 44c. a unit.* Speculation as to the future trend in the situation is rife, and includes such possibilities as a possible international agreement fashioned somewhat along the lines of the nitrogen agreements of the past decade. Certain it is with new producers a competitive condition strange to the marketing of potash is here to stay. Further, at the new price level, the development of additional potash fields in this country does not appear to be as attractive as formerly.

* Potash suitable for the chemical industry remains unaffected by the decline in prices for fertilizer grades.

No Longer A Deep Secret

George A. Mead, president, Mead Corp. (well-known to the chemical industry through his position of administration member of the Chemical Alliance), and Delancey Kountze, chairman, Devoe & Raynolds, were among those business leaders who met at the now famous 3-day meeting held at Hot Springs, Va., to discuss recovery. Mr. Mead, president of the present NRA Industrial Advisory Board, indicated that the fundamental principles of NRA should be retained after June 16, 1935, when the present recovery act expires. The board amplified this view by indicating that it regarded business rather than the Federal Government as the logical administrator of a permanent national recovery act.

No U. S. Helium Shortage

Acquirement of all gas rights in 50,000 acres comprising the Cliffside helium-bearing gas field, near Amarillo, Tex., has been completed by the Bureau of Mines. Field supplies raw material from which all helium used by the Nation's military services is extracted in the Amarillo helium plant, designed, built and operated by the Bureau. In addition to supplying current requirements, field provides a large reserve for future lighter-than-air craft operations of the army and navy.

When production and conservation of helium for Governmental use was delegated by Congress to the Bureau in '25, the old supply was failing and extraction costs were high. From the World War period, when members of its staff suggested production of helium for aeronautical use to the army and navy and directed experimental work to develop processes for its extraction, the Bureau has continued its studies of helium. Through these studies the area now known as the Cliffside field was found to contain gas of about 1¼% helium content.

After the source of supply of raw material was selected, bureau designed a plant of a new type and started its erection at Soncy, 7 miles west of Amarillo, in August, '28. Bureau also provided for the drilling of wells in the Cliffside field and construction of necessary pipe lines to bring the gas from the field to the plant. Production of helium at the Amarillo plant was started in April '29. In 5 years

COMING EVENTS

American Public Health Association, Pasadena, Calif., Sept. 3-6. W. R. Walsh, Secretary, 450 7th Ave., N. Y. City.

American Trade Association Executives, Wernersville, Pa., Sept. 9.

Technical Association of the Pulp & Paper Industry, fall meeting, Portland, Ore., Sept. 10-13.

A. C. S., 88th meeting, Cleveland, Sept. 10-14.

National Petroleum Association, Atlantic City, Sept. 19-21.

Electrochemical Society, fall meeting, N. Y. City, Sept. 27-29.

American Gas Association Convention and Exhibition, Atlantic City, Week of Oct. 29.

National Safety Council, Hotels Cleveland, Statler, Carter and Hollenden, Cleveland, Oct. 1-5.

Federation of Paint & Varnish Production Clubs, annual convention and joint show, Mayflower Hotel, Washington, D. C., Oct. 28-30. E. F. Maloney, du Pont, Chicago, chairman of the "Paint Show;" V. C. Bidlack, McCloskey Varnish, Philadelphia, chairman of the program committee.

American Institute of Chemical Engineers, fall meeting, Pittsburgh, November.

National Paint, Varnish & Lacquer Association, Annual Convention, Washington, Hotel Mayflower, Oct. 31-Nov. 2. R. W. Elton, secretary, 2201 N. Y. ave., N. W., Washington.

American Bottlers of Carbonated Beverages, 106th Armory, Buffalo, N. Y., Nov. 12-16.

Secretaries of Chemical Associations and Groups allied to chemistry (also the process industries) are urged to make use of this column.

of operation, plant has produced more than 57,000,000 cu. ft. of helium, or about one-half of all of that element ever recovered in the world. Operating costs have been less than one-third of the lowest cost at which helium was ever obtained by the Government from any other source. The Government's investment in plant, gas lands, wells, and pipe lines near Amarillo is about $2,100,000. Expenditures in operation over the 5 year period have been $666,000, and $159,000 has been returned to the Treasury from sale of residue gas. Thus the net operating cost of producing 57,487,000 cu. ft. of helium has been only $507,624, or $8.83 per 1000 cu. ft.

Obituaries

Thomas Blass, 73, who collaborated during the World War, with the late Thomas A. Edison on a method of producing picric acid from benzol, on June 21. He was superintendent of Lackawanna Steel's coke ovens from its formation to '22 when he became a consultant. . . . Dudley T. Warren, 44, chemist at the Roanoke Viscose plant, on June 11. . . . William Baxter Bader, Semet-Solvay chemical engineer, on June 9, in the wrecking of a commercial airplane on Mongaup Mountain, N. Y. He was returning from Washington with specifications and samples in connection with bidding on ammonium picrate for the Navy Dept. It was his 1st airplane journey. . . . Union B. White, 51, executive assistant in the Washington A.C.S. offices, in a fall June 12. . . . Henry Blumenthal, Jr., 60, vice-president and one of the founders of Western Borax, on June 17. . . . Herbert Hellis, 56, pioneer in the Philippine coconut oil industry and manager in that island for Spencer Kellogg, on June 27. . . . Mrs. Almeda Howard, wife of Frank Atherton Howard, president, Standard I. G. and also of Standard Oil Development, on June 27. . . . T. Howard Nance, 55, National Lead western representative on June 13.

Associations

Chemists' Club (N. Y.) golf tournament, held June 26, at the Westchester Hills Golf Club, White Plains, N. Y., brought out 75 members and their guests, a new record. Competition was close. W. R. Clark, a "darkhorse," however, had no difficulty in winning the "booby" prize, easily winning over Dealer John A. Chew who had previously been counted a "sure winner." At the salesmen's party the score opposite the Chew name read 173. Asked for a statement by a CHEMICAL INDUSTRIES' representative, Mr. Chew "choose" not to affirm or deny. "Let the figures speak for themselves," said Mr. Chew gravely, "I am saving myself for the Chemists' Club tournament.")

A. B. Baker, by virtue of his low-net score for the day, won the 1st leg on the "Carleton Ellis Trophy." William Callan acted as toastmaster. Talks in a lighter vein were made during dinner by R. B. McKinney, Dr. A. E. Marshall, Nelson Littell, John Glenn, Dr. J. F. X. Harold and O. J. Goodwin.

Ellis Trophy Rules

Competition for the "Carleton Ellis Trophy" shall be conducted during all official rounds of play during the Chemists' Club (N. Y.) Golf Tournaments. Official round of play shall be the 1st round of play during each tournament. Winner of the trophy shall be the player having the lowest average net score for the year's tournaments. If only one tournament is held within a calendar year, award will be made to the player having the lowest net score for the tournament.

Trophy must be won 3 times to become a permanent possession. Each winner shall have his name engraved on the trophy and shall be responsible for its safe keeping until requested by the Committee to surrender it for current competition. All net scores below par, shall tie at par. In the event of a tie for low net score, the player with the lower handicap shall be declared the winner. If 2 or more players with identical handicaps tie for low net score, winner shall be determined by matching scores. It is hoped that these conditions and rules will encourage and permit a maximum number of golfers of all classes to compete for the trophy.

Just Can't Lose

"Al" Alvarez, "Eddie" Orem and "Bob" Brewer proved to be the class of the Class A golfers at the recent Salesmens' Association tournament at the sporty Bonnie Briar Country Club ("Babe" Prior's home club), Larchmont, N. Y., on June 20. Second tournament is scheduled for July 17 at the Plandome Country Club, Plandome, L. I.

Prices Are Important

A Pricing Committee has just been formed by the N. Y. Board of Trade, according to Percy C. Magnus, president of the board. Mr. William Hurd Hillyer of James Talcott, Inc., is chairman. W. L. Churchill, well-known pricing expert and author of a book, "Pricing for Profit," has been appointed advisor to the Committee.*

Mr. Interlocutor?

Among those attending the annual dinner and minstrel show of the water purification division of the American Water Works Association held last month at the Commodore in N. Y. City were: Noel Statham, president, Industrial Chemical Sales, Diamond Alkali's William P. MacGill, "Bob" Quinn, Mathieson, John Billings, Stephen Kelly and Cley Brown of William S. Gray & Co. In the show were "Jack" Butler, "Joe" Wafer, Col. J. Wrench of Industrial Chemical Sales; William J. Orchard, Alan Johnstone of Wallace & Tiernan and a host of others well-known in chemical circles.

What's In Our Dry Lakes

David B. Scott, Pacific Coast sales manager, American Potash & Chemical, Los Angeles, addressed recently the Mineralogical Society of Southern California on "Minerals of the Dry Dead Lakes of Western California."

Self-Regulation Preferable

Chlorinated hydrocarbons producers have signed agreements with the U. S. Public Health Service to place warning labels on all packages in excess of 15 ounces. Signing ends 2 years of negotiation following promise of the industry to adopt a voluntary system of warning labels as a substitute for a bill pending in Congress to force labeling of all volatile poisons. Other groups of producers of volatile solvents which may be harmful to health are negotiating similar contracts.

Label agreed on for the chlorinated group of solvents reads:—

"Volatile Solvent. Use with adequate ventilation. Avoid prolonged breathing of vapor."

Project started in April, '32, at a hearing before the senate committee on agriculture on the Bingham bill for a federal volatile poisons act, suggested by Prof. Yandell Henderson, of Yale. See CHEMICAL MARKETS, Apr. '32, p 363. At that time M.C.A. secretary, W. N. Watson, submitted an offer on behalf of the industry to cooperate with the Public Health Service in labeling volatile substances hazardous to health.

Negotiations have been in progress ever since, largely between Dr. R. R. Sayers and Dr. William P. Yount, of the Public Health Service, and F. S. Low, of Warner Chemical. Signers are: Dow Chemical, Warner Chemical, Diamond Alkali, du Pont, Taylor Chemical, Carbide & Carbon Chemicals, and Niagara Smelting.

May Japanese rayon fabric experts set a new record. An export association is being discussed.

* See Chemical Industries, May, p. 412, for special article by W. L. Churchill.

MERCK
CITRIC ACID

IMPARTS NATURE'S OWN FLAVOR

CITRIC acid is one of Nature's most abundant pure fruit acids, found in such delicious fruits as the orange, lemon, lime, raspberry, pineapple, strawberry, cranberry, red gooseberry, currant, red whortleberry, tamarind and red elderberry.

In 1875 the Cresson Medal for "Perfection of Result" was awarded to the Citric Acid made by Powers & Weightman—the first chemical establishment in America to manufacture this product and the first to guarantee its purity and uniformity.

THE GOLD MEDAL STANDARD

The consolidation of Powers, Weightman, Rosengarten with the Merck organization to form the combined institution of Merck & Co. Inc., ensured the maintenance of those same standards of high quality in the manufacture of Citric Acid under the Merck label.

Merck Citric Acid is an exceptionally fine product. There is only one grade available under the "Gold Medal Standard" and that is the best. Manufacturers who want their products to have Nature's own flavor know that they can depend upon the guaranteed purity of the Merck product.

You can procure Merck Citric Acid in crystals, in granulated, or in powder form. Whatever your needs, we can supply them. For further information and prices address the General Sales Division—

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Washington

73rd Congress Adjourns After Passing Record Amount of Legislation—How Does It Affect Chemical Industry—

The 73rd Congress conceded to have passed more legislation than any other, except the World War Congress, adjourned *sine die* June 18. With bewildering rapidity and with almost machine-like precision, one measure after the other was forced through the 2nd session, which began Jan. 3. How, where, when and why do these measures affect the chemical and allied industries?

The Bankhead Cotton Control Act (approved Apr. 21) fixes 10,000,000 bales as the maximum amount of cotton harvested in the crop year of 1934-35 that may be marketed exempt from a ginning tax.* It levies a tax of 50% of the average central market price per lb. of lint cotton on any excess of the 10,000,000 bales, with a minimum tax of 5c per lb. It permits the President to extend operation an additional year, provided 2/3 of those interested approve. Fertilizer industry sees likelihood of lessened fertilizer consumption next season. There is no unanimity of opinion as to how much. Less cotton means less cottonseed oil, cake and meal. Less cotton production will be felt in industries using cotton, cellulose - lacquers, rayon, pyroxylin, artificial leather, non-shatterable glass, film explosives, plastics, etc.

Troublesome Section 7A

Section 7A, considered innocuous originally by the framers of the NRA, and really intended to be clarifying, has proven a thorn in the side of the Administration. Employers claim it gives to the American Federation of Labor a signed blank check, or at least that the A. F. of L. so looks upon it. Unions are equally insistent that it does not go far enough, and that through employee unions employers are attempting to thwart the purpose of the act. Rallying to the support of organized labor Senator Wagner framed the so-called Wagner Labor Bill. For two months the Administration wavered back and forth, one minute cold to the proposition and in the next apparently lending it undercover support. Finally, confronted with the stark necessity of doing something before Congress adjourned, with the country afflicted by an epidemic of strikes, the Administration brought about the passage of the Labor Disputes Joint Resolution which authorizes the President to establish a board or boards to investigate issues, facts, practices and activities of employers or employes in controversies arising under Section 7A. Board or Boards are empowered to conduct fair elections by employes to determine who will represent them under the collective bargaining section of the NRA. Life of the Board is limited to one year. Measure is frankly a stopgap for the Administration to work up a permanent satisfactory act, and to put an end to the determined opposition of industry generally to the Wagner Bill (CHEMICAL INDUSTRIES, Apr. '34, p. 337, also June, '34, p. 529).

Chemical executives have watched the Administration's Reciprocal Tariff Act through Congress (approved June 12) with misgivings and distrust. Measure authorizes the President for a period of 3 years to negotiate trade agreements with foreign countries without the traditional advice and counsel of the Senate; he may raise or lower rates by not more than 50%. Only an infinitesimal part of the voting public are direct buyers of chemicals. The chemical industry although one of the country's largest (judged by value of products) is a relatively small employer of labor. Will political expediency dictate what industries are to be sacrificed—is the thought running through the minds of leading chemical executives? The industry, sensing the inherent dangers attached to the act, have fought it, although doomed to defeat. (CHEMICAL INDUSTRIES, May, '34, p. 435).

Coconut Oil—A National Issue

On March 24 the Philippines were voted their independence (effective within 10 years). On May 10 The Revenue Act of 1934 was approved containing provisions for imposing a processing tax of 3c a lb. on a list of vegetable and fish oils and fats, and 5c a lb. on coconut oil and copra except on imports from the Philippines, which products would bear the 3c tax. In signing the Revenue Act President Roosevelt condemned the inclusion of the 3c tax on Philippine oil, and in a special measure, (May 28) urged Congress to undo the damage done since the provision violated the "spirit and intent" of the Philippines Independence Act. (CHEMICAL INDUSTRIES, June, '34, p. 549). Coconut oil tax was backed originally by the agricultural votes in both branches (CHEMICAL INDUSTRIES, Apr. '34, p. 354) and they chose to ignore, in this case, the President's wishes. Direct result already has been higher prices announced for soaps and with the strong possibility of further increases. Some increase in use and price of tallow will naturally follow. Some increase in the use of cottonseed oil in the manufacture of oleomargarine and in the manufacture of soap is also quite likely to appear shortly. Whether it will add impetus to the growing use of the higher fatty alcohols in the place of soap both industrially and in the home is an interesting possibility.

"Pump-priming"

The Home Owners Loan Act of 1934 was approved Apr. 27 and among other things provides for a fund of $200,000,000 for repairs, rehabilitation, modernization, rebuilding and enlargement of homes. Upon this and the PWA† the Administration was largely depending for the "pump-priming." Paint, varnish, lacquer, glass, are the chemical process industries that will most likely benefit directly from these expenditures. The Housing Bill, passed in the last minutes of the Session, and which greatly expand the original Home Owners Loan Act, was made a "must" by the President. The $2,000,000,000 borrowing power of the Home Owners Loan Corporation is increased by $1,000,000,000, and the $300,000,000 approved for HOLC loans for repairs was included in this billion instead of being a separate item as before. The limit of $200,000,000 to which the Federal Government was authorized to guarantee $1,000,000,000 in private loans for home repairing was left unchanged at the last moment at the insistence of the President, but he is authorized to raise it at his discretion, which would make possible a vast increase in private loans. The Housing Bill is the answer of the Administration to the criticism leveled at the recovery program for not including the so-called durable goods industries in the Government's gigantic attempt to frankly buy our way back to prosperity. Measure provides for a single administrator and Harry Hopkins is mentioned as probable choice.

Perhaps the most far-reaching in the long run and certainly the most controversial act of the recent Congress was the Gold Reserve Act of 1934 (approved Jan. 30) which authorized

* 1933 final crop report—13,047,262 bales.

† PWA has provided 2,886 million hours' work.

the President to revalue the dollar at 50 to 60% of its existing statutory gold equivalent and created a $2,000,000,000 stabilization fund. If any doubt remained as to the trend towards inflation this action dispelled it thoroughly. Aside from this, however, it did change the import and export situation profoundly. For 2 years or more American products (and a fair-sized quantity of chemicals of various groups were included) were receiving very little attention from foreign buyers when countries with depreciated currencies could offer much more attractive prices. In addition, a number of these countries with depreciated currencies, were finding it possible and profitable to ship products into this country, products which in normal times were unable to displace domestic materials. In this group were important chemicals, such as ammonium sulfate, superphosphate, finished fertilizers, and, indeed, for a time a serious threat was made by Japanese alkali producers to lay down in the N. Y. market bicarbonate of soda and caustic (CHEMICAL MARKETS, Feb. '33, p. 145).

"Uncle Sam"—Banker

After months of discussion the Government has entered the banking business. On June 21 the RFC began to make loans to private companies under the following general rules: 1. In general loans will not be made when the proceeds are to be used to pay off indebtedness. 2. Company applying for loan must show that it is operating under the NRA or the President's Re-employment Agreement. 3. Unreasonably high salaries may not be paid with the RFC the sole judge of what is unreasonable compensation. 4. As long as a loan is in effect no corporate applicant may pay dividends without RFC consent. 5. Loans must be adequately secured, and again the RFC is judge of what is and is not sound. 6. Loans will not be made to finance consumer purchases, installment sales or similar contracts; to finance imports or exports, for the development of promotional purposes, or to enable business concerns to expand into new fields of endeavor; to any business in receivership save under certain prescribed conditions.

The Tugwell-Copeland Pure Food and Drug Bill died in the Senate Committee, likewise legislation covering old age pensions, unemployment insurance and the Connery 30-hour Week Bill. That these measures will play a prominent part in the next session is a foregone conclusion. The 30-hour a week measure particularly would play havoc in many continuous chemical processes. Indeed it is said that NRA Administrator Johnson did not approve of this proposal because of the inconvenience it would cause industries where continuous operation is vital.

A Foregone Conclusion

With no witnesses appearing and no testimony offered the Tariff Commission closed its hearing June 21 on synthetic camphor (CHEMICAL INDUSTRIES, May, '34, p. 443; also June, '34, p. 536) and will forward a report to the President. It is fully expected that this will show that the minimum production requirements of synthetic have been met and that no change in the 5c rates on synthetic will be reduced to 1c, the rate for crude natural material.

Garvan vs. Ezekiel

President Roosevelt expressed himself June 6 as heartily favoring development of pulp and newsprint from Southern pine.

His statement, made to newspaper men, was interpreted by Georgia members of Congress as lessening fears that the government might frown upon this and other new industries in view of the proposed tariff negotiations through the reciprocal trading bill.

President Roosevelt made his attitude known when asked to comment on a recent letter from Mordecai Ezekiel, Agricultural Dept. economic advisor, to Francis P. Garvan, Chemical Foundation president, stating that Federal support for establishing the new industry was not appropriate at present because of the proposed tariff negotiations.*

Washington "Sidelights"

Oscar B. Ryder, career man in tariff service, is now a member of the Tariff Commission.... Tariff Commission has prepared compilation showing for recent years value of imports of articles which are dutiable when imported under ordinary circumstances, but which are entered free under special provisions. Articles listed fall under 2 main groups: 1. Articles dutiable when imported from most countries but free from the Philippines, Virgin Islands, or Cuba. 2. Group of articles free when employed for specific purposes. . . . On June 18 President Roosevelt signed the bill for duty-free foreign trade zones at American ports. . . . It is expected that one will be established on Staten Island, N. Y. City. . . . Roosevelt recovery program has cost to date $4,311,597,238, or about ($900,000 a day) $1,000 for each of the 4,000,000 who have been re-employed in some way since Mar. 4, '33.

NRA In June

Code Authority for the oxy-acetylene industry has submitted to NRA a budget of $37,550 for the period May 1 to Apr. 30, '35. Assessment is 1/3 of 1% of the dollar volume of each member, payable either in total or quarterly with a $10 minimum assessment . . . Code Authority for the CO_2 industry has asked approval of amendments which would revise price filing procedure, use of containers, and contractual relationship with jobbers. Permission is asked for a plan of assessment. . . . Criticisms of proposed modifications of the fullers earth industry were heard by Deputy Administrator C. L. Hickling July 6. Of the several modifications suggested, one would permit Code Authority to enlarge its membership by 2, and another would permit drawing up of an assessment plan. Still another would permit certain standard labor provisions. Hardwood distillation has requested approval of a $13,715 budget. Proposed basis of contribution is a maximum of $8 per year for each rated cord capacity of individual members, with the treasurer of the Code Authority to issue a call for $1 per cord rated capacity as needed to defray administrative expenses. There are 39 establishments with estimated total net sales of $6,000,000 for the year '33, and the proposed budget amounts to 23/100 of 1% of such sales.

An Alcohol Code

U. S. I.'s Glenn Haskell, president of the Industrial Alcohol Institute, presented the industry code (supplementary to the basic code of the chemical industry) at a hearing June 12. Also present were: Col. James H. Hayes, Standard Alcohol; R. H. Grimm, American Commercial Alcohol; J. W. McLaughlin, Carbide & Carbon Chemicals; A. K. Hamilton, Pennsylvania Alcohol Corp.; C. Esteva, Puerto Rico Distilling, and Major T. P. Walker, Rossville Commercial Alcohol; J. Warren Kinsman, du Pont, and J. J. Smith, Publicker Commercial Alcohol.†

Leather Hits Back

Hide and Leather in June 30 issue states: "Consumers Advisory Board of NRA will shortly, according to reliable sources, initiate an investigation on what appear to be almost conscienceless substitutes for leather in shoes. Under fire especially would be evidences of improper advertising of shoes and all leather goods whereby the public is led to believe that goods containing substitutes are actually of real leather. A possible outcome will be the adoption by the Boot and Shoe Code of standards making necessary the labeling of shoes as to the character of the materials used in the product."

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* For Mr. Garvan's scathing rebuttal to Mordecai Ezekiel, see p. 19, this issue.

† Additional NRA news on pages 63, 64, 65 and 67.

Code Personnel

G. L. Armour (Associated Dyeing; also National Aniline Products, Heyden Ansbacher-Siegle, etc.) was reelected to the code board for the silk and rayon dyeing and finishing industry on June 18. . . . H. E. Hold, Ohio State University, has been named administration member of the preformed plastic products industry. . . . F. C. Brown, Washington business consultant, has been named administration member of the fullers earth code authority. . . . Clarence G. Spencer of the engineering firm of Baker & Spencer, N. Y. City, is administration member of the liquefied gas industry. . . . George W. Farny, Morris Plains, N. J., is administration member of the lead code. . . . Theodore I. Dunn, N. Y. City, has been named administration member of the sanitary and waterproof specialties manufacturing industry.

Trade Commission

Misrepresentation in connection with the sale of aspirin tablets is charged by the Commission in a complaint against Bayer. Company is given until July 13 to file its answer showing cause why the Commission should not issue an order requiring it to cease and desist from the practices complained of.

Commission recounts the facts that aspirin was first manufactured by Bayer's predecessor, a German corporation, which invented acetyl salicylic acid, importing it into the U. S. in 1899, in which year it also registered the name "aspirin" as a trademark, obtaining a U. S. patent in 1900. It sold aspirin at 1st in powdered form to manufacturing chemists, retail druggists and physicians, but to the public only on doctor's prescription. About 1904, the German company authorized chemists to prepare it in tablet form for the retail trade but, according to the Commission's complaint, "in no case did the name of the respondent or its predecessor appear upon the containers." The chemists sold it under their own names as "aspirin." Bayer 1st sold tablets as aspirin directly to the public in '15, but in '17 its patent expired and the right to use the name aspirin as the name of the product in connection with sales to the public became free to all. In '18, the patent office cancelled the trade-mark registered in 1899 after a long drawn out legal battle that at times was extremely bitter.

Commission has ordered Adams Paint, Cleveland, to discontinue misrepresenting composition of paints, to discontinue claim of ownership or operation of a factory in which paints sold are manufactured, to discontinue claim paints are sold at factory prices, unless and until such are the facts, and to discontinue misrepresenting resistance to heat offered by the roof coating.

Commission June 24 dropped charges against American Smelting & Refining of violating the Clayton Act through acquisition of Federated Metals stock. Commission held that it lacked jurisdiction but indicated that the acquisition complained of might well be the basis for court action. Section 7 of the Clayton Act makes it unlawful for a corporation to acquire stock of another when effect of such acquisition is to substantially lessen competition.

Waterproof Fabrics?

Misrepresentation of the properties of silk and velvet fabrics, treated by a special process, is charged in a Federal Trade Commission complaint just issued against Aqua Seal Corp. and Duplan Silk Corp., both of N. Y. City. Respondents are alleged to have falsely represented that fabrics were permanently waterproof and permanently water spot proof before and after dry cleaning.

These qualities were said to have been imparted to the fabrics by use of the "aqua-sec" process of which Aqua Seal Corp. is the owner and licensee and by means of which, it was claimed the surface or pile of fabrics or textiles, including silk and velvet, may be impregnated with chemicals causing the fabrics to resist, more or less, penetration or saturation by water spots, water or other liquids or soiling material.

According to the complaint, Aqua Seal licensed United Piece Dye, and Rochelle Park Velvet to use the process for Aqua Seal customers with the understanding that the 2 companies purchase the material and chemicals needed from Aqua Seal. Aqua Seal granted Duplan Silk right to have the "aqua-sec" process used on Duplan velvet fabrics which, when so treated, were sold under the name "L'Eau-Vel." According to the complaint, respondents advertised that no other velvet or silk fabrics than those processed, treated or finished by the aqua-sec process, including "L'Eau-Vel," had the qualities or characteristics of being permanently waterproof and permanently water spot proof before and after cleaning.

These assertions, according to the Commission, were "false representations of material facts concerning the effects of the use of the aqua-sec

process on silk and velvet fabrics," and the respondents knew, or with the exercise of reasonable care should have known, according to the complaint, that the representations were untrue and that fabrics treated by this process are not permanently waterproof or water spot proof and do not withstand the usual number of drycleanings given such fabrics during the reasonable life of the goods.

New Issue

Federal Trade Commission announced during June following registration statement (under the Securities Act of 1933) of interest to chemical and allied fields:

CITRUS SOAP CO. (2-945, Form D-2), 530 Broadway, San Diego, Calif., a California corporation proposing to issue 6,626¼ shares of common out of an authorized 15,000 shares, share for share, in exchange for 1,800 shares of preferred and 4,826¼ shares of common of Citrus Soap Co. of California, in a reorganization, new company to be known as Citrus Soap Co. Amount of issue is not to exceed $250,000. New company was organized solely to take over assets and liabilities of the old company by merger proceedings for the purpose of eliminating preferred of the old company. Among officers of the new company are: George T. Franck, president; Frank A. Gazaly, secretary, and R. G. Newbegin, treasurer, all of San Diego.

Personnel

Alfred L. Loebenberg has been named an executive of Barrett to act in the capacity of vice-president and assistant to the president. Mr. Loebenberg is well known in the chemical industry with which he has been associated in important executive positions for many years. A graduate of M.I.T., Mr. Loebenberg was formerly vice-president of U. S. Industrial Chemical, which post he resigned to assume his new office. Previous to that time he served as director of manufacture and subsequently vice-president in charge of sales of National Aniline, a division of Allied. He was previously associated with Beckers Aniline & Chemical Works, which was developed into one of the most important factors in the American dyestuffs and organic chemical industry.

Sill Now Monsanto

Monsanto announces appointment of Theodore W. Sill as assistant manager of sales to specialize particularly on intermediates and kindred products. Mr. Sill was formerly with E. C. Klipstein & Sons Co., and is well known in the dyestuffs and intermediate field.

Hercules Promotes

C. E. Kinney, for many years technical service manager, Hercules' naval stores dept., has been given a new assignment to handle special problems for the naval stores dept. New duties will involve close cooperation with sales and development as well as with technical service. J. M. Schantz, formerly assistant to Mr. Kinney, has been made manager of naval stores technical service.

C. E. KINNEY

J. M. SCHANTZ

Two outstanding Hercules' naval stores men take on greater responsibilities

Mr. Kinney was one of the pioneers in the design of the steam and solvent process for the manufacture of naval stores, and he contributed greatly to the development of this process in manufacturing plants. Through his many years of experience in naval stores, Mr. Kinney is a familiar figure in naval stores circles and affiliated industries. He will continue contact with his many friends in the trade on special problems. Mr. Schantz is a graduate of Penn. State. He entered employ of Hercules in '18 and has had a varied experience in many branches of the company's activities. He has been Mr. Kinney's assistant for the past 10 years.

Others In New Fields

Walter G. Whitman, associate director of research for Standard of Indiana, is now M.I.T. chemical enginering head. . . . Dr. Gardner A. Norton, physicist, and recently engaged in special studies at Harvard Engineering School, has joined Arthur D. Little, Inc. Dr. J. Raymond Sanborn, recently with the research division, International Paper, is another addition to the Little organization. . . . Eugene Eagle is now Chicago representative for Vitro Mfg. (Pittsburgh ceramic color maker). . . . J. M. Porter is president, Kentucky-Tennessee Clay, Mayfield, Ky. He succeeds late R. O. Wilford. "Ed" Gardner will serve as vice-president. Stockholders will meet at the end of the year for permanent officers. . . . Glen G. Grogan, formerly with Vitro is now selling in the Chicago area for R.&H. division of du Pont. . . . Dr. William L. Sampson, connected with Rutgers for several years, has joined the Merck staff as a bacteriologist. . . . F. M. Moffatt, Jr., is an assistant vice-president, U.S.I. . . . M. D. Leh, is now assistant sales manager for General Petroleum of California.

Arco's new Western manager is J. E. Eckert, formerly manager of the St. Louis district for Truscon Laboratories. . . . Muralo Co., Staten Island, has appointed Louis W. Breeves, Cleveland, as Ohio and Western Pennsylvania territory. . . . Luther Martin IV, formerly associated with Wilckes-Martin-Wilckes, has joined C. K. Williams, Easton, Pa. . . . Paul Primm has been appointed sales manager of the lacquer division of the Martin-Senour Co., Chicago.

Trips

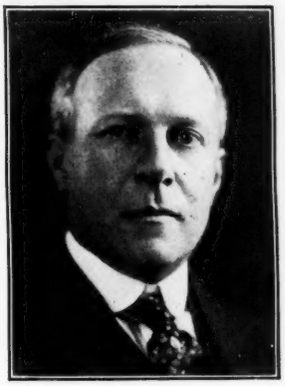
"Fred" Koch (Dow) and Mrs. Koch were in Midland recently during a midwestern vacation trip. . . . "Joe" Wafer, Industrial Chemical Sales manager, was in the middle-west last month. . . . G. E. Getchell, Archer-Daniel-Midland's Edgewater, N. J., plant, was in Minneapolis for 3 weeks. . . . Beck, Koller's vice-president, W. H. Breuer, flew to the Coast late last month and is cooperating with the Marshall Dill organization (Beck, Koller representative on the Pacific Coast). . . . Dr. James K. Stewart, Chicago, Anderson-Prichard's director of industrial naphtha research, came East for the A.S.T.M meeting at Atlantic City late in June. . . . John W. Rutland, Baltimore manager for J. K. Welsh & Co. (fertilizer materials, etc.) was in N. Y. City offices late in June.

Dollars For Timber

Brown Corp. of Montreal (an affiliate of Brown Co.) has sold certain timber rights for $750,000. About $500,000 will be used to pay off Canadian bank loans. Anglo-Canadian Pulp & Paper (a Lord Rothermore interest) has acquired exclusive rights to make and market within the British Empire (except Canada) the paper and pulp products of the Brown Co. which are based on the patented "Solka" (cellulose) product.

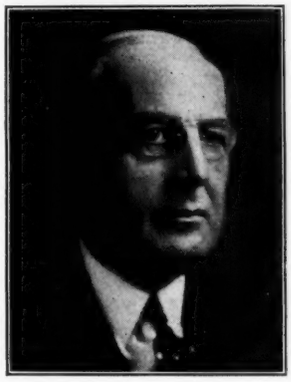
Personal

George A. Whiting's *Dauntless* was in the recent Bermuda race. Mr. Whiting is president, Standard Phosphate & Acid, Baltimore, and is one of the best known yachting enthusiasts in chemical circles. He was at New London for the Yale-



Calco's Merz, a doctor of science at Rutgers

Harvard race. . . . August Merz, president of the N. J. section of the A.C.S., also president for many years of the S.O.C.M.A., received the degree of doctor of science at Rutgers June 7. . . . E. A. Darling, vice-president, International Selling Corp., sailed July 5 for a 6-week's trip to Europe and will include Spain, Germany and Belgium in his itinerary. While in Spain he will visit the Potasas Ibericas potash mines. . . Lawrence E. du Bey, factory manager, Ditzler Color, Detroit, was given an honorary degree in June by the Detroit Institute of Technology. . . . Hugh C. Peters (manager of Thurston & Braidich's gum dept.) and Mrs. Peters are spending July on a southern cruise. . . .



A.A.C.'s Bowker, now board chairman (L. H. Carter is new president) sails for a rest in Bermuda

Horace Bowker and Mrs. Bowker sailed June 20 for a month's vacation in Bermuda. Mr. Bowker has been ill. . . . Late William C. Procter left an estate valued at $4,217,484. . . . George C. Crossley, president United Clay Mines, Trenton, N. J., is president of the local Rotary Club.

A. J. Lansing (Colgate-Palmolive-Peet), and R. K. Shirley (Freeport, Texas) have been elected directors of the N. Y. Control of the Controllers Institute of America. . . Arthur E. Misfeldt, recently transferred to Cleveland from the N. Y. City offices of du Pont's R. & H. chemicals division, was married last month to Miss Margaret Coyne, formerly secretary to the organization's N. Y. City Manager. . . . George M. Armour, vice-president, McCormick & Co., Baltimore, and William A. Wellman, fertilizer broker, attended the annual meeting in Minneapolis of the Imperial Council of the Ancient Arabic Nobles of the Mystic Shrine. Both are former potentates of Boumi Temple, Baltimore. . . . Lammot du Pont brought his yacht, the *Nama*, to Fisher's Island (in Long Island Sound) on June 28. He has bought a house on the Island.

Foreign

Rapid development of Japan's chemical industry is one of the remarkable phases of that country's industrial progress in the last 2 or 3 depression years. Donald W. Smith, American Trade Commissioner at Tokyo, reported recently to the Commerce Dept. Japanese chemical industry has expanded to such an extent in the last 2 years it not only has a dominant position in the home market but also has penetrated Asiatic markets which European chemical cartels have considered to be their exclusive sales territory.

Because of this competition European cartels have been endeavoring to make working agreements with Japanese producers, and representatives of the former have visited Japan for that purpose. (CHEMICAL INDUSTRIES, June, '34, p. 534; also p. 539; also May, '34, p. 439). All of the proposals advanced by these representatives, it is reported, have contained provisions for the restriction of Japanese exports of certain chemicals. Chemical industry, like a number of others in Japan, has been fostered by the government through subsidies, high import duties and licensing of imports of certain items. Industry was greatly stimulated by depreciation of the yen, which automatically checked imports and allowed domestic manufacturers to reap the full benefit of increased industrial activity and heavy demand for chemicals.

It is said the European chemical manufacturers realize recent growth of exports from Japan is only beginning and that it is just a matter of time before they must share Asiatic markets with Japanese producers. Among the items on which export restrictions have been proposed recently are sulfate of ammonia, sodium bichromate, chlorate of potash and matches.

International Chemical Prices

Index numbers of wholesale prices for chemicals during 1st quarter of '34 were downward in Germany and Belgium and upward in Italy, according to data published in the Board of Trade Journal, London. Index number of chemicals and drugs for the U. S. was up 2 points, to the highest of the past 2 years. Based on 1913 as 100 for Germany and Italy, April, 1914 as 100 for Belgium, and 1926 as 100 for the U. S., index numbers were as shown in the subjoined table:

			Quarterly average				
Country	Average, 1932	Average, 1933	Jan.-Mar. 1933	Apr.-June 1933	July-Sept. 1933	Oct.-Dec. 1933	Jan.-Mar. 1934
Ger.	105.0	102.5	103.0	102.6	102.6	101.7	101.2
Bel.	539.0	508.0	524.0	511.0	510.0	489.0	483.0
Italy	300.3	275.1	283.9	277.2	271.6	268.9	273.6
U. S.	73.5	72.6	71.4	72.8	73.0	73.3	75.2

Superphosphate Cartel

German superphosphate industry, which has been united under the name of the German Superphosphate Co. on the lines of a cartel, has been placed by the Minister of Finance under an investment control to prevent uneconomic placing of new capital. In practice, this means that the erection and carrying on of new concerns are forbidden. On an average about 50% of the capacity of the factories has been used up, and they are seriously affected by the large quantities of basic slag imported. Embargo continues until Dec. 31, '36.

"Montecatini" Reports

In its annual report "Montecatini" stated that its group gave employment 6 days per week to 25,346 workmen and 2,104 other employees in '33, as against 21,186 workmen and 1,763 other employees in '32 and 20,133 workmen and 1,693 other employees in '31. Net profit for '33 reached 65,672,000 lire, compared with 53,100,000 lire in '32 and 64,296,500 in '31. "Montecatini" in addition to manufacturing some 100 chemicals, extends its activities into sulfur, pyrites, copper, zinc, lead, and lignite mines, marble quarries and marbleworks, sawmills, jute and rayon factories, hydroelectric power stations, electric railways, steamers, and aluminum works. Its properties are scattered over all Italy and Sicily.

I.C.I. will redeem out of liquid resources debentures of subsidiary companies totaling £3,645,854.

Traffic

Freight car loadings in the 3rd quarter of '34 will be about 4.5% above actual loadings in the like quarter in '33, according to estimates compiled by the 13 Shippers' Regional Advisory Boards. Boards estimate that loadings of the 29 principal commodities will be 5,172,897 cars in the 3rd quarter of '34, compared with 4,950,860 actual loadings for the same commodities in the corresponding period last year.

Actual loadings in the 2nd quarter this year for the country as a whole showed an increase of about 11.7% over the like '33 period. It was previously estimated by the Regional Advisory Boards that loadings for the 2nd 3 months of the year would show an increase of 10.7% over the comparable period a year ago.

Estimated loadings for chemical and allied products for the 3rd quarter, with actual loadings for the like period in '33 and the percentage of increase or decrease follow:

Commodity:	Estimated 1934	Actual 1933	Esti. % increase
Coal and coke..	1,721,649	1,656,939	3.9
Salt	29,974	28,950	3.5
Petroleum and pete. prods....	496,365	479,554	3.5
Fertilizers	29,861	28,123	6.2
Chemicals and explosives ...	19,760	18,485	6.9

Company News

American Cyanamid & Chemical has acquired plant, properties, and business of Burton Explosives, Inc., Cleveland, Ohio, which latter company has since its organization in '30

Brings to Cyanamid nearly 40 years of close association with the explosives industry—J. S. Burton

been engaged in the manufacture and sale of high explosives and blasting supplies.

Explosives plant, covering 415 acres, is located at New Castle, Pa. with a capacity of 18,000,000 lbs. annually. Plant is complete for the production of commercial high explosives and is designed to prepare and manufacture a number of the raw materials used. Plant and processes are the result of the long experience of Mr. Burton and his associates. Processes and methods installed result in an extremely economical operation.

Acqusition of this company brings to the Cyanamid organization a large production of high explosives and an established distributing organization covering 20 odd states with magazines conveniently located to serve the trade in that area. "Burton Explosives" have been well and favorably known. Their high standards of quality and service will be maintained and expanded.

J. S. Burton, President, Burton Explosives, Inc., brings to Cyanamid a thorough knowledge of the explosive business together with a manufacturing and sales organization of experienced men of proven ability in their respective fields. Mr. Burton has been connected with the industry since 1895. Business of Burton Explosives, Inc. will be carried on as the Burton Explosives Division of American Cyanamid & Chemical, 30 Rockefeller Plaza, N. Y. City.

Dow Chemical Report

Abstracted from Dow's report for fiscal year ending May 31, '34:

"During the past year sales of magnesium and Dowmetal have reached a new peak and consumption of the product is increasing at a steady rate. Actual poundage of Dowmetal increased 108% over last year to a total of 422,164 lbs. Shipments of pure magnesium totaled 1,918,139 lbs., against 627,943 lbs. last year, increase of 205%. Combined shipments of 2,340,303 lbs. of magnesium and Dowmetal were an increase of 181% over the preceding year, although dollar sales represented a gain of 157%. A considerable tonnage of magnesium has been exported this year, due to our low cost of production in combination with other favorable factors.

"Employment during the past year reached a new peak, payroll currently totaling 3,019 employes, against 2,012 a year ago and 1,825 at the like time in '32. A year ago the company had just adopted a 39-hour week schedule and the principle of 4-shifts in all operating plants. After operating on this basis for about 2 months, NRA came into effect, which demanded such adjustment.

"Contrary to some impression, it should be stated that we are not extracting gold in the plant of the Ethyl-Dow Chemical Co., nor do we anticipate we will extract it in the near future. Fact that we handled tremendous volumes of water in the plant may seem a justification that in the future other valuable products will be produced from the water, but at the present time we have no plans

President Willard Dow's annual stewardship report creates widespread interest

for extracting gold. The costs of operation of the Ethyl-Dow Chemical Co. are meeting our fondest expectations and the plant in capacity production is doing everything it was designed to do.

"We have acquired property in Bay City on which we are building a dock to take care of transportation by steamer of raw materials for finished products for our Midland operations. The primary purpose of this dock is to receive shipments of sulfur and coal for our requirements. This spring we shipped over 2,000 tons of calcium chloride to Sweden. It was not possible, due to construction in progress, to ship this over our dock, but it is easy to see that it will only be a question of time before such a thing will take place. Our dock location and the depth of the river at this point are sufficient to handle transportation for ocean-going shipments. Construction of the dock and the dredging required are nearly finished. We expect it to be completed by the first of August and available for use during this season."

At the April meeting of directors a 50% stock dividend was authorized, payable July 2 to stock of record June 16. "This stock dividend," said Mr. Dow, "is distinctly in line with the dividend policy we have pursued for many years."

Directors were reelected. In order to centralize executive positions, E. W. Bennett of Midland, formerly assistant treasurer, was made treasurer, and J. S. Crider of Cleveland, former treasurer, becomes assistant treasurer. A. P. Beutel was appointed assistant general manager, a new position. L. A. Chichester, assistant secretary and assistant auditor, was advanced to the post of auditor from assistant secre-

tary and assistant auditor, to which positions Fred Brown was appointed.

To Give Or Not To Give?

An interesting experiment has just been initiated. For a period of 3 months, free samples of diglycol oleate, diglycol stearate, glycol boriborate and Stacol will be sent to all chemists who think they can use one or more of these products in their formulation. A folder giving new physical data on these products is now ready for distribution. Many new uses and formulae are given in it. Requests for samples should be sent to Glyco Products, Development Dept., Bush Terminal, Brooklyn, N. Y. Results of this offer will indicate whether the 6 year policy of "no free samples" will be continued or "made to walk the plank."

Briefly Summarized

National Oil Products again has an exhibit at the Century of Progress. . . . R. T. Vanderbilt has been appointed by Dewey and Almy Chemical, Cambridge, Mass., as exclusive sales agents on "Darvan" new dispersing agent. . . . Crescent Chemical, 38 Endicott st., Peabody, Mass., is introducing a new pigment finish for sport elk and side leather that is washable without the use of formaldehyde thereby retaining the desired feel and mellowness indefinitely.

The Month's Moves

Alex C. Fergusson Co. (Large Philadelphia chemical jobber) is moving executive offices back to the Drexel Bldg. to provide additional warehouse and laboratory space at the Oregon ave. building. . . . "The double A.C." (American Agricultural Chemical) and Bowker Chemical have moved general and executive offices to 50 Church st., N. Y. City. . . . M. Werk Co., Cincinnati, has moved Columbus, Ohio, headquarters to the Burdell Bldg., and will install a show room. . . . Godfrey L. Cabot's offices are now located in larger quarters in the Columbian, National Life Bldg., 77 Franklin st., Boston. Laboratories remain at 12 Lincoln st. Company reports a new well struck in Gilmer Co., W. Va., . . . Enequist Chemical, Brooklyn, has moved into its new building at 255 Freeman st.

Cyanamid Brand of Golf

In Cyanamid's opening golf tournament, held at the Grassy Sprain Golf Club, Yonkers, M. Iwanyshayn, who turned in a low gross score of 79, carried off the Calco trophy. Committee cup for the individual low net score was taken by J. P. Soden, with a card of 92-93-69. A. Schwarwachter used the smallest number of putts, and H. B. Bishop was given the kickers' handicap award. President's trophy was won by the Warners Works team, composed of C. R. Matheny, J. M. Rugh, J. F. Carroll, and M. Iwanyshayn, with a score of 311. Structural Gypsum team was 2nd with 316.

New Construction

A contract was let July 2 for the construction of a club house for Hercules Powder, on a site adjacent to its Experiment Station, Hercules, Del. Located on one of the vantage points of the company's large tract of land, the new club house affords an excellent view over miles of picturesque Delaware and Pennsylvania hill country. Work on the new structure will be started immediately by Rupert and Fulenwider, Inc., of Wilmington. The building will be completed in October.

And, In Addition —

Champion Co. (embalming fluids) at Springfield, Ohio, plans a large addition. . . . Trinity College, Hartford, Conn., has just received an anonymous gift of $400,000 for a new chemical laboratory.

"Quotes"

Editor Harrison E. Howe, *Industrial and Engineering Chemistry:* "Undertake to find a particularly well-trained man in chemistry, when a specialist is wanted for a new task, and learn how difficult it is . . . The truth of the saying 'there is always room at the top' is emphasized even when a far larger number of those claiming chemistry as their forte are without satisfactory employment than any one would have thought possible."

George A. Renard, secretary, *National Association of Purchasing Agents:*

"The majority of purchasing agents is convinced that higher prices are coming by Fall, and their inaction at the present time is prompted by a desire to wait until the trends they now see have materialized."

Metal Notes

Peruvian export duties on vanadium and concentrates are expected to be reduced to '24 level of $22 at the request of Vanadium Corp. . . . House of Representatives, by a vote of 226 to 96, approved a resolution recently authorizing its foreign affairs committee to investigate sources and supplies of tin in the interest of national defense. . . . H. O. King, former NRA deputy, will administer the copper code.

Customs and Tariffs

An interdepartmental committee on foreign trade agreements has been set up. Committee was established to advise with respect to organization and execution of the work connected with foreign trade agreements under the Tariff Act. The interdepartmental committee consists of representatives of the State, Commerce, Agriculture and Treasury departments, the tariff commission and the office of the special advisor to the President on foreign trade. Committee held its 1st meeting on June 29 and considered plans for establishment of committees to deal individually with each country. Functions of the committee will be to arrange for such general economic studies as may be deemed necessary in connection with the reciprocity program as well as studies relating to particular negotiations.

Cobalt Oxide Dumping?

Bureau of Customs June 28 reported that the appraising officer at Pittsburg issued a notice June 11 of suspected dumping against a shipment of black oxide of cobalt from Germany. Anti-dumping unit of the bureau is investigating the matter, and meanwhile all imports of this commodity will be under a dumping bond.

Customs Decision

Braun Corporation, Los Angeles.—Arsenic acid anhydride, in the absence of commercial proof as to the name under which it is bought and sold in the trade, is held to be properly classified as an acid anhydride not specially provided for at 25% rather than as arsenic acid at 3c per lb. as assessed.

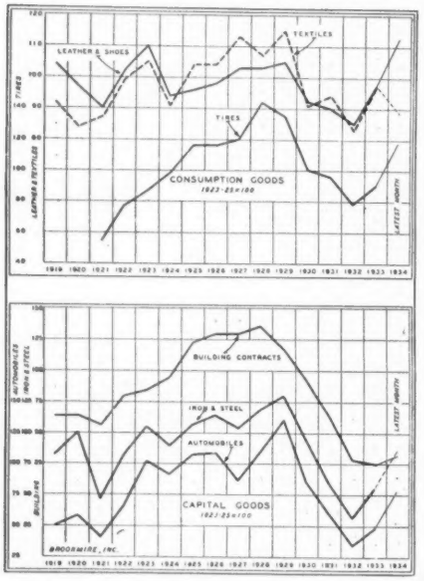
Foreign Customs Rulings

Mexico is now admitting the use of calcium and magnesium arsenite or arsenate free when imported in containers of more than 20 kilos, formerly dutiable at 2 centavos per legal kilo. . . . U. K. has refused duty exemption on barytes, dry earth colors . . . Brazil has now in effect a brand new tariff rate structure . . . Guatemala has reduced the tariff rates for a number of industrial chemicals . . . New Zealand has exempted calcium chloride from the sales tax . . . El Salvador has granted duty exemption to lime sulfur for use in sugar manufacture . . . Greece has prohibited use of linseed in manufacture of edible oils and fats . . . Mexican tax has been reduced slightly on industrial nicotine and oil of wintergreen . . . More complete data on these changes listed above are available from the Bureau of Foreign and Domestic Commerce, Washington, Chemical Division, or a local office of the department.

Heavy Chemicals

Just Seasonal?

Volume of industrial chemicals moving into consuming channels declined gradually as the month of June closed —whether this merely represented the usual seasonal decline it was difficult to discover. Certain it is that buyers in many cases were holding strictly to a policy of hand-to-mouth buying. Seasonal items, such as calcium chloride and ammonia, were reported moving out in sizable quantities. Outstanding in the price changes was the decline of acetate of lime to $2.50 brought about by light demand and accumulating stocks. A compensating reduction in acetic was made immediately.



What the large chemical consuming industries are doing

Another feature was the preparation by the code authority of the agricultural and insecticide industry of a statement for NRA to show the existence of a price emergency on both calcium and lead arsenates. For several months the competitive position of these 2 items has been specially severe. A revised price schedule has been issued on ammonia and potash alums with special differentials for under 25 bbls.; 25 bbls. or over, and carlots. New schedules follow:

Ammonia alum, granular, carloads, bbls, $2.75 per 100 lbs.; 25 bbls. and over, $2.90 per 100 lbs; less than 25 bbls, $3 per 100 lbs. Lump, car lots, $3 per 100 lbs.; 25 bbls. and over, $3.15 per 100 lbs.; less than 25 bbls., $3.25 per 100 lbs. Powdered, car lots, bbls. $3.15 per 100 lbs.; 25 bbls. and over, $3.30 per 100 lbs.; less than 25 bbls. $3.40 per 100 lbs. Potash granular, car lots, bbls., $3 per 100 pounds; 25 bbls. and over, $3.15 per 100 lbs.; less than 25 bbls., $3.25 per 100 lbs. Lump, car lots, bbls, $3.25 per 100 lbs.; 25 bbls. and over, $3.40 per 100 lbs.; less than 25 bbls., $3.50 per 100 lbs. Powdered, car lots, bbls., $3.40 per 100 lbs.; 25 bbls. and over, $3.55 per 100 lbs., and less than 25 bbls., $3.65 per 100 lbs. The price for bag packing is 20c. per 100 lbs. lower, and contract prices are 10c. per 100 lbs. lower. For truck or ex-warehouse deliveries in all metropolitan zones, add 25c. per 100 lbs. All prices are f.o.b. sellers' works, freight equalized with nearest competitive points.

Important Price Changes

ADVANCED		
Acid, naphthenic	$0.12	$0.10
DECLINED		
Acid, acetic, 28%.....	$1.66	$2.91
Calcium acetate	2.50	3.00
Camphor, slabs	.51	.52
powder	.51	.52
Tin oxide	.54	.56

Gathered Here and There

Southern Alkali is developing supply of natural gas with W. F. Knode, former chief petroleum engineer for the Railroad Commission, in charge. Outside construction is practically completed and operations are expected to begin Sept. 1. . . . Italy headed world's '33 copper sulfate production with 106,000 tons against 99,000 in the previous year. . . . Soda ash and caustic exports from the U. K. increased from 91,955 tons in the 1st 4 months of '33 to 100,066 tons in the corresponding period this year. Exports of caustic declined. British India was the biggest buyer, with an aggregate of 27,051 tons this year. . . . Ministry of national economy at Mexico City announces opening of a sulfur refinery with a maximum daily capacity of 900 metric tons at Arista, San Louis Potosi State.

H. B. Prior Co. is now the Prior Chemical Corp. Management and personnel remain unchanged. . . . Grasselli is dismantling plant at Birmingham, Ala., but will retain offices and warehouses. . . . Fire destroyed part of Riverside Acid Works, Warren, Pa.

Turner & Liq. Carb. of Potash

Joseph Turner & Co., sole selling agents for Niagara Alkali (pioneer producers of domestic caustic potash), has answered the insistent demand for liquid carbonate of potash-tank cars, tank-wagon and drum deliveries. Commenting, Manager Walter Merrill states, "Its clarity and quality is appealing, particularly to the textile trade." Stocks are available at strategic points.

Fine Chemicals

Mercury Points Higher

A sharp increase in demand for mercury against a background of small stocks has given rise to the general belief that higher prices are quite likely. A number of strychnine salts were revised upwards. Silver nitrate closed with a small gain over the price prevailing on May 31. Seasonal increase in demand was noted for citric and tartaric, and both price levels were reported firm. Alcohol sales were at a minimum and the trade was awaiting next season's anti-freeze prices before forming any opinions on the future market trend. The firm price situation in the corn market forced an upward rise of 20c on corn syrup in the 3rd week of the month.

"Ye '34 Chemical Almanack"

Merck is distributing 250,000 copies of a "1934 Chemical Almanack," described on the title page as a "short history of chemistry very proper for all who may be interested, including apothecaries, chirurgeons, students, and other ingenious persons."

Important Price Changes

ADVANCED		
Corn syrup, 42°.....	$3.44	$3.24
43°.....	3.49	3.29
Silver nitrate	.33⅜	.32⅝
DECLINED		
Camphor tablets	$0.57	$0.58

A newly founded French concern, Société d'Exploitation des Algues marines, located at quai Malaquais, Paris, proposes to manufacture iodine and its compounds.

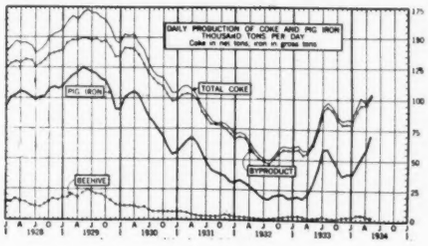
Pfizer's July price list shows one price reduction and 3 advances.

Coal Tar Chemicals

Prices Firm, Unchanged

Firm and unchanged prices again featured the market for coal tar chemicals. Toluol and solvent naphtha were in good demand, phenol moved in satisfactory quantities but benzol sales were only fair. Dye sales reflected the curtailed conditions in the textile field.

Steel mill activity declined sharply in the last 10 days of the month. Output of by-product coke in May amounted to 3,191,869 tons per day, compared with



U. S. Bureau of Mines

2,875,451 tons in April and 1,921,257 tons in May last year. Daily average of pig iron production increased 14.5%. Total stocks at by-product plants remained practically stationary at 1,947,710 tons. At the rate of production in May, total by-product stocks were sufficient to last 18.9 days, in comparison with 20.5 days' supply at the close of April. Benzol production in May was placed at 7,237,000 gals. as compared with 6,411,000 gals. in April and 4,412,000 gals. in May last year. For the 1st 5 months the total was placed at 31,309,000 gals. as against 19,515,000 gals. in the same period last year.

Amount of tar recovered in May reached 44,012,676 gals. as against 41,431,113 gals. in April and 25,578,300 gals. in May last year. To the end of May total was 199,658,627 gals. as against 115,314,308 gals. in the same period '33. Light oil production was estimated at 60,251,672 gals. for the 1st 5 months as against 38,394,541 gals. in the similar period last year. May production was placed at 13,747,689 gals. as against 12,378,824 gals. in April and 8,547,565 gals. in May last year. Ammonia sulfate, or its equivalent, was recovered to the amount of 53,915 tons in May as against 48,517 tons in April and 28,106 tons in May last year. Total to the end of May was 236,293 tons as against 142,568 tons in the same period last year.

Coal Tar Chemicals In '33

Outstanding features of the U. S. Tariff Commission report on production and sale of dyes and other synthetic organic chemicals for '33 are the production of 100,952,178 lbs. of dyes or 7% more than the average for the period '25-'30. Sales of dyes totaled 98,228,671 lbs. ($43,095,630), or 6.5% more in volume, and 9% more in value than the '25-'30 average, and exceeded '32 by more than 30% in quantity. Sales of unclassified and special dyes, included in this total, increased to 7,725,254 lbs. valued at $7,787,901. In this group remarkable progress is shown in dyes for acetate silk, oil and gasoline, and rubber and resins. Many new direct, developed, and vat dyes were reported, as well as increased production of the Zambesi blacks. Increased demand for dyes by the textile industry accounts for a large part of the increase in sales.

Outstanding among the coal-tar intermediates in '33 as compared with '32 are increased production of aniline oil 52%, refined naphthalene 65%, phenol 138%, and phthalic anhydride 125%. These increases are due mainly to the increased demand for the synthetic resins derived from these materials. Total production of intermediates was 370,708,000 lbs. or 4.6% more than the peak year of '29.

Sales of coal-tar medicinals, by quantity, exceeded any year since 1919, and were 48% higher than in '30. Unit value of sales averaged $0.85 per lb. as compared with $0.97 in '32 and $1.45 in '30.

Remarkable increases are noted for synthetic resins derived from phenol and cresol. Sales quantity increased 61% over '30 and 86% over '32, while unit values declined from $0.38 per lb. in '30 to $0.23 in '33. Separate data for resins derived from phthalic anhydride are published for the 1st time. Sales of synthetic resins not of coal-tar origin increased 82% in quantity and 119% in value over preceding year. Separate data for urea and thiourea resins are also shown for the 1st time. At least part of the increased activity in synthetic resins was due to demand for closures for beverage bottles, and for containers of cosmetics, toilet preparations, and food.

Activities in synthetic organic chemicals not of coal-tar origin reached an all-time peak in '33 with a production of 767,574,117 lbs. and sales totaling 538,990,467 lbs. valued at $52,401,327. Production increased 26%, and sales volume 23% over '30, while sales value decreased 20%. Outstanding in this field are the synthetic alcohols (ethyl, butyl, and methyl) used as solvents and as antifreeze in automobile radiators, formaldehyde used principally in synthetic resins, carbon tetrachloride increasingly used in dry cleaning, acetic anhydride a raw material for rayon, acetone, and others. Following table compares '33 production and sales of the most important groups with the average for '25-'30, and with '32. Data for '31 are not available in detail.

Coal-tar Crudes: Production and Sales, 1933[1]

Tar distilled [2]	Oil-gas tar	1,043,931 gals.		$52,438
	Water-gas tar	30,154,122 gals.		990,008
	Coal tar	189,657,715 gals.		8,343,580
	Total	220,855,768 gals.		9,386,026

		Production (Quantity)	Sales: Quantity	Sales: Value	Sales: Unit value
Tar	gal.	[3]363,298,586	241,000,100	$8,980,956	$0.037
Light oil and derivates:					
Crude light oil	gal.	103,023,997	7,843,234	741,082	.094
Benzol (except motor benzol)	gal.	19,382,352	19,722,822	3,452,529	.175
Motor benzol	gal.	40,224,022	38,654,902	4,379,737	.113
Toluol, crude and refined	gal.	[3]11,539,107	11,541,990	3,123,738	.271
Solvent naphtha	gal.	[3]2,717,254	2,570,981	449,968	.175
Xylol	gal.	[3]2,101,377	2,271,658	521,775	.230
Other light oil products	gal.	5,329,997	2,445,350	420,318	.172
Naphthalene, crude and refined	lb.	[4]30,620,754	25,252,619	350,410	.014
Crude tar acids	gal.	2,858,513	724,740	206,435	.285
Creosote oil	gal.	57,436,545	58,030,083	4,779,076	.082
Tars, refined	gal.	[4]6,902,851	6,550,278	658,160	.100
Tars, road	gal.	[2]95,613,206	99,062,021	7,813,899	.079
Other distillates	gal.	[2]6,785,571	6,763,174	934,971	.138
Pitch or tar	tons	588,728	323,065	3,742,675	11.585
Pitch of tar coke	tons	[2]27,828	33,082	287,572	8.693

[1] Data for coke ovens and gas works reporting to Bureau of Mines; and for tar refineries and others reporting to United States Tariff Commission.
[2] Reported to United States Tariff Commission only.
[3] Reported to Bureau of Mines only.
[4] Includes crude and refined naphthalene reported to Bureau of Mines and crude naphthalene reported to United States Tariff Commission.

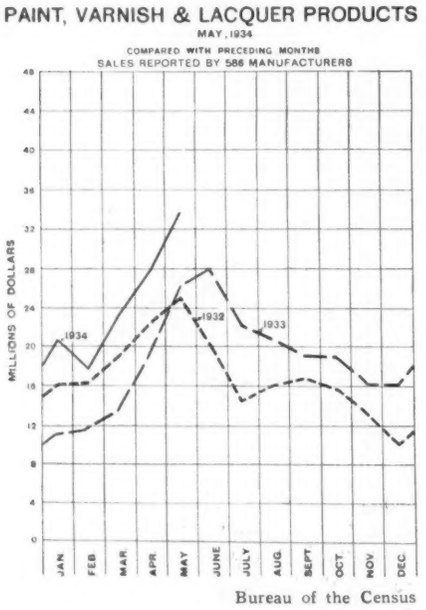
Neville Publishes

Neville Co., Pittsburgh, Pa., has just released a most comprehensive booklet (in loose-leaf style, permiting issuance of additions and corrections from time to time) of its many coal by-products chemicals, including naphthas, resins, tars, etc. A detailed review of the booklet is given in the Company Booklets' Section of this issue, page 39.

Paints, Lacquers and Varnish

Summer Dullness

Manufacturing operations in the paint, lacquer and varnish fields declined gradually in the 1st 3 weeks of last month and then in the final week declined rather sharply. Price movements



Bureau of the Census

were almost entirely on the downward side. All of the lead oxides were off as the metal market weakened. May building operations showed an advance over April. The expansion in repairs, alterations and modernization opened up through the HOLC is expected to give a decided impetus to paint sales within the next 60 days.

Raw Material Prices

Manufacturers of titanium and zinc pigments are offering contracts for the last 6 months at unchanged levels. White lead is now quoted:—20-ton lots, 6½c. per lb.; smaller quantities, 6¾c. per lb., both in bbls. These prices are delivered to all points except the states of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming. Prices in the aforementioned states are ¼c. per lb. higher. Prices for basic sulfate white lead are ½c. per lb. lower than basic carbonate at all points.

Dry lead schedule is as follows:—20-ton lots, 6½c. per lb., delivered. For deliveries in Alabama, Arizona, Arkansas, Colorado, Florida, Georgia, Idaho, Louisiana, Mississippi, Montana, New Mexico, Nevada, Oklahoma, Texas, Utah, Wyoming and the territory west of the Cascade Mountains in Oregon and Washington, add ¼c. per lb. Five-ton lots are quoted at 7c. per lb., and less than 5-ton lots at 7½c. per lb., delivered. For deliveries

Important Price Changes

ADVANCED

None

DECLINED

Casein, Argentine, 20-30	$0.1285	$0.14¾
80-100	.13½	.15¼
Lead oxides, all reduced ¼c		
Zinc oxide, French imported, white seal..	.10⅜	.11⅛

in Alabama, Arkansas, California, Florida, Georgia, Louisiana, Mississippi, Oklahoma, Texas and the territory west of the Cascade Mountains in Oregon and Washington, add ¼c. per lb. For deliveries in Colorado, Montana, New Mexico and Wyoming, add ½c. per lb. For deliveries in Arizona, Idaho, Nevada, Utah and the territory in Washington and Oregon east of the Cascade Mountains, add ¾c. per lb. All of the prices are for dry red lead (95% or less Pb_3O_4).

Litharge is now quoted:—20-ton lots, 5½c. per lb. delivered, except in Alabama, Arizona, Arkansas, Colorado, Florida, Georgia, Idaho, Louisiana, Mississippi, Montana, New Mexico, Nevada, Oklahoma, Texas, Utah, Wyoming and the territory west of the Cascade Mountains in Oregon and Washington. Price for 5-ton lots is 6c. per pound delivered and in less than 5-ton lots 6½c. per pound delivered. For deliveries in Alabama, Arkansas, California, Florida, Georgia, Louisiana, Mississippi, Oklahoma, Texas and west of the Cascade Mountains in Oregon and Washington add ¼c. per pound; for deliveries in Colorado, Montana, New Mexico and Wyoming, add ½c. per lb.; for deliveries in Arizona, Idaho, Nevada, Utah and east of the Cascade Mountains in Oregon and Washington, add ¾c. per lb.

The new orange mineral schedule is: Mineral ex-red lead, 2½c. per lb. over the price of dry red lead (95% or less Pb_3O_4); mineral ex-white lead, 3¾c. per lb. over the price of dry red lead (95% or less Pb_3O_4) at all points.

Most of the varnish gums were soft in the past 30 days with several quotations definitely lowered.

Hopeful Prognostication

Reports from various parts of the world indicate that paint and varnish production and consumption are definitely on the upgrade. Exports of American paint products reflect growing demand throughout the world. During 1st quarter overseas shipments of such products were valued at $2,872,800, compared with $2,257,000 for the corresponding period of '33, an increase of 27%.

Double Service

Manufacturers of paint and allied products will be interested in the new Lin-x shipping box recently brought out by Acme White Lead and Color, Detroit. Box, designed and produced by Hinde & Dauch Paper, Sandusky, Ohio, is made of double-double corrugated fibre board and has a basket-weave design which is produced in an attractive brown color. Most important of all is the dual purpose this box serves. In addition to its use as a shipping box it can be converted in just a few seconds into an attractive counter display stand. Box is simply cut open along the dotted lines printed on the box, top is folded back and a display stand is the result.

Paint and chemical specialty manufacturers are evincing great interest in the economical and display aspects of Hinde & Dauch's combined shipping and display box

With the Paint Associations

N.P.V. & L.A. has increased its membership to 476 indicating substantial results from the current membership drive. . . . "Dave" Litter, president, D. H. Litter & Co., was chairman of the N.Y.P.V. & L.A. outing held June 28 at Briarcliff Manor. . . . President Trigg has called a meeting of the Recovery Board to be held July 10 at the Drake in Chicago. The Executive Committee will meet July 11 at the same place. . . . F. P. Gross, Jr., Air Reduction Sales, spoke on "The Use of CO_2 In The Paint Industry" on June 11 before the Baltimore Paint & Production Club. . . . J. Sibley Felton, retiring chairman, executive committee of the Philadelphia P.V. & L.A., entertained his fellow committee members at luncheon on June 15. . . . H. J. Hoffman, Baker Castor Oil, N. Y. City, was the guest speaker June 11 of the Cincinnati-Dayton-Indianapolis Paint and Varnish Production Club. . . . More than 100 members of the paint and varnish production clubs of New York and New England were the guests of C. K. Williams & Co., Easton, Pa., June 15 to 17 for their joint outing of 1934.

Quoting President Trigg

N. P. V. & L. A. will meet in Washington, Oct. 31 for a 3-day session which may be extended. Said President Trigg:

"In view of the kaleidoscopic and fast-moving events and readjustments which date from the approval of the code of fair competition for the paint, varnish and lacquer manufacturing industry by President Roosevelt, which was coincident with our organization meeting in Chicago, the coming convention will be one in which we may all 'find ourselves'. We shall have had practically a full year of the 'New Deal,' and this 1st annual convention of our new organization should be one in which we can co-ordinate the experience of our 1st year with definitely and intelligently established associational policies and practices, and make it the most important and valuable 'get-together' in the long history of annual meetings of the organized members of our industry."

Paint Co. Notes

Glidden's May profits were $285,251 compared with $230,355 for April. Extension of the time of maturity on the Company's outstanding 5-year 5½% notes has been authorized to June 1, '39 by preference stockholders. . . . Schaefer Co., Louisville manufacturer of paints, varnishes and lacquers, has purchased the raw and finished stocks of Sun Varnish.

McCann-Erickson's art dept. in San Francisco is responsible for the completely new designed paint containers for W. P. Fuller & Co.

Personnel

Smith Chemical & Color has added J. Robert Smith, well-known in the dry color, pigment and paint materials field, to its sales force.

Following Chemical Trend?

Shifting of the paint and varnish industry from the East and Middle-West to the South is foreseen by the chemical division head, Bureau of Foreign and Domestic Commerce, C. C. Concannon.

Direct Dry Color Code

Dry color industry code authority has been elected and includes A. F. Brown, of Imperial Color; J. Allegaert, United Color & Pigment; Max Marx, Max Marx Color & Chemical; Lothare S. Kohnstamm, H. Kohnstamm & Co.; Baron Isaacs, Brooklyn Color; O. H. Smith, J. Lee Smith Co; and Guy A. McCorkle, Krebs Pigment & Chemical. NRA representative is G. A. Prochazka.

Naval Stores

Dissatisfied

Naval stores markets were in a state of unrest during the past month. A great deal of dissatisfaction is manifesting itself in the detailed working out of the AAA agreement and a number of factors are voicing disapproval of the quotas allotted. In addition, there are a number of influential groups that are opposed to government loans. Prices of rosin and turpentine continued to sag badly despite a better statistical picture when comparison is made with a year ago. Sales in primary centers have been light and the export trade to date has been in the main discouraging.

The Naval Stores Control Committee has decided to increase sales allotment for the 9 months April-December from 381,000 units to 436,500 units, and to allow tags for July sales totaling 66,000 units.

It is estimated, reports the *Savannah Weekly Naval Stores Review*, that at the close of July tags will have been issued for 52% of the total new allotment for the 9 months.

On the basis of the new allotment for April-December, during which time approximately 92% of the year's production is made, leaving 8% for January-March, the total sales allotment for this naval stores year of 1934-35 would be 475,000 units. A unit, as is generally known, comprises 1 barrel spirits turpentine and 3-1/3 barrels rosin.

Increase in the allotment for the 9 months April-December from 381,000 to 436,500, or by 55,500 units, is based on the Control Committee's claim that its investigations disclosed that the crop of naval stores produced last year was 516,000 units instead of 450,000 units, an increase in the last crop estimate of 66,000 units.

Newport Industries has closed down its Bay Minette, Ala., plant because of the lack of further storage facilities.

May production of naval stores by steam distillation and solvent treatment of wood and stocks of these products on hand May 31, according to data collected by the producers' committee, through Arthur Langmeier, Hercules Powder, secretary, were:

PRODUCTION

	Rosin, 500-lb. bbls.	Turpentine bbls. (50 gals.)	Pine oil gals.
Month of May	43,243	7,050	293,807
Total from April 1, 1934	88,697	14,779	599,085

STOCKS AT PLANTS

Total May 31, 1934	98,080	20,689	.....
March 31, 1934	89,963	19,253	.....
Change	+8,117	+1,436	.....

Note:—Rosin production and stocks include all grades of wood rosin.

Winner—Newport

Court of Customs and Patent Appeals on June 4 upheld the Patent Office in granting a patent on a process of treating rosin to Robert C. Palmer, Newport Industries' (Pensacola) chief chemist and director of research. Patent is on "a solid rosin product substantially free of crystalline abietic acid and containing a relatively small quantity of an alkali metal abietate." It was contested by Joseph N. Borglin, who filed a patent application Apr. 12, '28, prior to that filed by Palmer. However, Palmer claimed that in July, '26, customers of the company complained of abietic acid in rosin and he directed his assistant, John L. Burda, to use sodium soap in attempt to improve the product, a process which led to the patent application.

An Outside Viewpoint

N. Y. Journal of Commerce, commenting on 3rd quarter business states: "The 3rd quarter of the current year is likely to prove the worst for many industries, both in respect of volume of activity and profits."

Chemical Specialties

Code Authority Approval

General Johnson has approved following as Code Authority for the agricultural and fungicide industry. R. E. Demmon, Stauffer Chemical, N. Y. City; G. F. Leonard, Tobacco By-Products & Chemical, Louisville; C. M. Slaughter, J. Schnarr & Co., Orlando, Fla.; R. K. Vickery, California Spray Chemical Corp., Berkeley, Calif.; G. R. Rinko, John Powell & Co., N. Y. City; J. B. Cary, Niagara Sprayer & Chemical Corp., Middleport, N. Y.; R. N. Chipman, Bound Brook, N. J.; D. E. Connolly, Ansbacher-Siegle, N. Y. City; G. E. Riches, Bowker Chemical, N. Y. City; and H. P. Mansfield, Grasselli Chemical, Cleveland. Administrator's approval is contingent upon his later determination of the status, in this industry, of the pyrethrum-rotonone group of manufacturers. In the event this group is to be excluded from the agricultural insecticide and fungicide code, Mr. Rinko automatically will cease to be a member of the Code Authority as a representative of the group. Should the pyrethrum-rotonone manufacturers be continued under this code, a general meeting of the members of that group will be called for the purpose of electing a member of the Code Authority.

Month's Outstanding Specialty

"Plastikon" putty, a compound similar in appearance and consistency to ordinary painter's putty, with the important exception that it is combined with rubber, is a new product being marketed by B. F. Goodrich Rubber. Not only are most of the advantages of ordinary putty claimed for the new compound but the use of rubber is said to yield additional benefits. Of unusual interest is the fact that this putty requires no mixing, since it contains practically no oil. It effectively resists corrosive chemicals and fumes and, because of its rubber content, offers very high resistance to moisture. Another property, peculiar to this putty, is its high degree of adherence to steel surfaces. Plastikon Putty is being marketed in 15 lb., 75 lb., and 225 lb. cans as well as in small pint cans for household use.

And Also —

Past month's introductions include "Vapoo" a new rug and upholstery cleaner or "shampoo"; Savogran, a cleaner and polish for silver, glass, porcelain and metals generally; another new rug shampoo that of the Hild Floor Machine Co., sold in cans and bottles.

N.A.I. & D.M. at Chicago

The 20th annual mid-year meeting of the National Association of Insecticide & Disinfectant Manufacturers held at the Edgewater Beach Hotel, Chicago, June 11-13, attracted nearly 200. Code discussion and a number of addresses by outsiders featured the sessions.

Peter Dougan, Merck, presided. Convention was in charge of H. W. Hamilton, White Tar, with J. L. Brenn, Huntington Laboratories, and Henry A. Nelson, Chemical Supply, actively in charge of the program. John Powell, John Powell & Co., handled the general arrangements. Grant A. Dorland, MacNair-Dorland Co. (*Soap*) was in charge of general entertainment with Max Goodrich, Hudson Manufacturing, heading the golf tournament committee.

Personnel of the Code Authority for the insecticide and disinfectant manufacturing industry has been approved. Association members are: Dr. Robert C. White, Philadelphia; H. M. Clark, Dr. Hess and Clark, Inc., Ashland, O.; W. G. Griesemer, The Black Flag Co., Baltimore; W. B. Eddy, Rochester Germicide Co., Rochester, N. Y.; and J. L. Brenn, Huntington Laboratories, Inc., Huntington, Ind. Petroleum refining members—W. J. Andree, Sinclair Refining, N. Y. City; and W. J. Zick, Stanco, Inc., N. Y. City. Non-association members—H. A. Brereton, Worrell Manufacturing Co., St. Louis; and E. C. Bolte, Michel and Pelton Co., Emeryville, Calif.

Code and Golf

Agricultural insecticide and fungicide manufacturers from N. Y. and New England met June 7 at Swampscott, Mass., to discuss code matters and then enjoyed an afternoon of golf and dinner at the Corinthian Yacht Club, Marblehead, Mass.

New In the Field

Picture Soap Co. Filed by Irving E. Rifkin, 38 Park Row, N. Y. City. . . . Cyclone Chemical has been organized in Buffalo, N. Y., by Harry A. Zeising, 49 Delwood road, Kenmore, N. Y., and associates, to manufacture chemical products.

To Europe

Samuel C. Zirlin, sales manager, Marine Laboratories, 45 Commerce st., Brooklyn, sailed on the *Leviathan* June 9 to visit company agents in a number of European countries.

Soap "Suds"

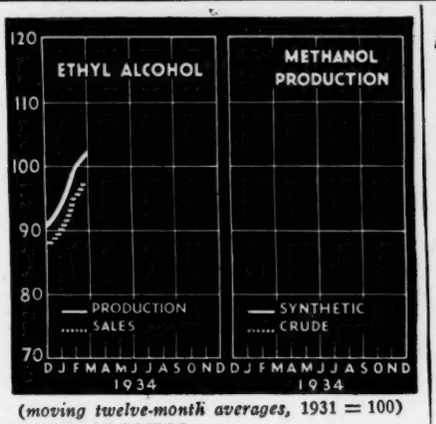
Soap Code Authority met in Chicago June 21 for a discussion of code matters. . . . F. W. Murphy, Armours, N. Y. City, soap dept. manager, has retired and is succeeded by W. J. Merrins. . . . A. D. Rettinger, formerly with C-P-P, Canada, is now a director and general manager of J. T. Robertson, Syracuse soap manufacturers. . . . Billy B. Van (former well-known musical comedy "funster") is now president of Pine Tree Products. For years he sold Pine Tree soap to every hotel he stopped at . . . Mistral, Lexington, Mass., reports "Jalma" a new soap for woolens and other fine textiles. . . . M. W. Williams, Glendale, L. I., is reported ready to manufacture a powdered hand soap. . . . Homer Ban-

Continental Can designers are responsible for these two new attractive containers—left, one of a series for R. H. Macy's private brand of specialties; right, container for Franklin Research of Philadelphia

SOLVENT NEWS

Reg. U. S. Pat. Off.

JULY ★ A Monthly Series of Articles for Chemists and Executives of the Solvent-Consuming Industries ★ 1934



(*moving twelve-month averages,* 1931 = 100)

ETHYL ALCOHOL			
Production		1934	1933
1000 proof gals.	Jan.—March	39,879	23,327
	March	12,313	8,229
	February	13,810	9,084
Sales			
1000 proof gals.	Jan.—March	33,887	22,427
	March	11,464	7,751
	February	10,867	7,498

METHANOL—1934 figures on Methanol production have not yet been made available.

SOLVENT WITHDRAWALS HOLD WELL THIRD QUARTER PRICES UNCHANGED

Withdrawals of solvents and diluents continued in orderly fashion during the past month, reflecting the healthy basic position of the major consuming industries. The fact that the demand held at the level of the preceding month is encouraging when it is considered that a slight seasonal decline would have been normal at that time.

Prices for the majority of solvents and diluents as well as prices for industrial alcohols have been posted for the third quarter at no change from the schedules in effect during the preceding period.

In the paint, varnish and lacquer industries, sales were continuing their upward trend with no sign of any immediate leveling out of operations. Latest available figures released by the Department of Commerce report April sales equal to those of the peak attained in July of last year.

SELECTING PETROLEUM JELLY FOR MAKING PRINTING INKS

The incorporation of petroleum jelly in printing inks as a softener and reducing agent, and when desired, as a drying retardant, is well known. Care, however, must be exercised in the proper selection of the type to be used.

A recent article on the subject lists the following characteristics as important. Amber color (not green) should be employed; consistency should be controlled to insure uniformity in the finished product. For the reduction of tackiness in inks, the petroleum should be of medium fibre. If long it would be tacky itself and if short it would not blend properly with the oils and result in a thin bodied ink. The viscosity should run about 60-70 Saybolt seconds at 210° F. and the melting point should be between 115-120° F. for best results.

ANHYDROUS ALCOHOL USES EXPANDING IN FIELD OF SOLVENTS AND CHEMICALS

Quantity Production and Low Cost Encourage Wider Use; Anhydrous Alcohol-Solvent Blends Effect Material Cost Savings in Lacquer Industry

The uses and adaptations of anhydrous alcohol are continually being expanded, because of its moderate cost and because it is both a solvent and a chemical raw material—thus serving two distinct industrial fields. For many years anhydrous ethyl alcohol has been prepared in small quantities for laboratory use, but it was not until the U. S. Industrial Chemical Co., Inc., began to produce it in large quantities that this valuable product was made available as a general industrial solvent and chemical.

The method employed by U. S. I. for quantity production of anhydrous alcohol is based on the phenomenon of "azeotropism" by which a mixture of liquids yields a distillate of lower boiling point than that of any of its individual components. This exclusive U. S. I. process has made anhydrous alcohol available at only a small additional cost over the ordinary 95% or 190 proof grade.

The commercial uses of anhydrous alcohol fall into two broad classes: as a solvent and as a chemical. In the first group, anhydrous alcohol offers three outstanding features: economical cost; good solvent power, especially in conjunction with ester solvents; and mild non-residual odor.

Advantages as Lacquer Solvent

As a lacquer solvent, anhydrous alcohol offers many advantages. It is a good solvent for A.S. nitrocellulose and a latent solvent for R.S. nitrocellulose. For resins it is more nearly a universal solvent than any other single solvent known. Because of this feature it is also an excellent blending agent. Both resin and nitrocellulose solutions containing anhydrous alcohol generally have lower viscosities than those made with esters and hydrocarbons alone. Blends

(*Continued on next page*)

LOEBENBERG RESIGNS U.S.I. POST TO JOIN BARRETT COMPANY

A. L. Loebenberg, vice-president of the U. S. Industrial Chemical Co., Inc., has resigned his position with U. S. I. to join The Barrett Company in the capacity of vice-president and assistant to the president.

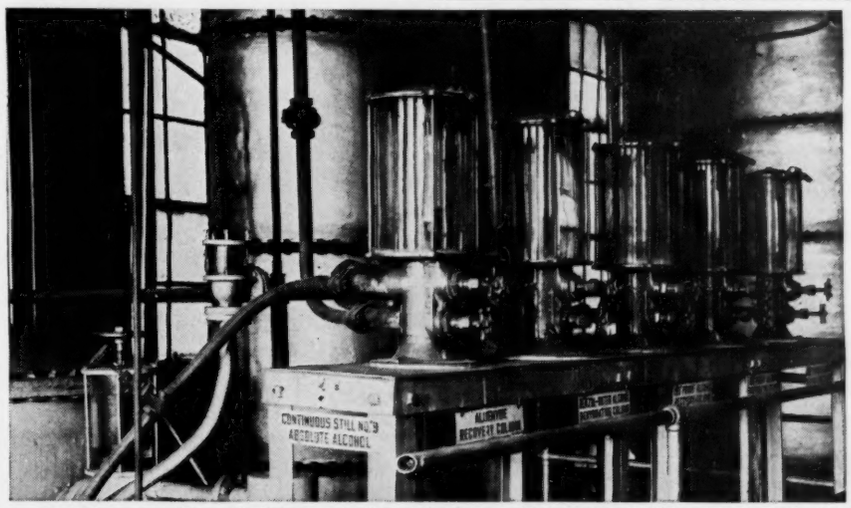
Mr. Loebenberg is well known in the chemical industry with which he has been associated for many years. Prior to his connection with U. S. I., he held executive positions with the National Aniline & Chemical Co., Inc., and the Beckers Aniline & Chemical Works, Inc.

His many friends and associates at U. S. I., where he was also closely associated with SOLVENT NEWS in the guidance and direction of its policies, join in wishing him every success in his new position.

F. M. MOFFAT, JR. JOINS U. S. I.

The appointment of Fraser M. Moffat, Jr., as assistant vice-president of the U. S. Industrial Chemical Co., Inc., was announced by Charles S. Munson, president of the U. S. Industrial Alcohol Co. and parent company of the U. S. I. group.

Mr. Moffat assumes his new post with a background of long experience in the chemical field. Prior to his connection with U. S. I., he was a member of the firm of Earl, Moffat & Co., Inc.



A complete assembly of tail-boxes in the anhydrous alcohol plant of the U. S. Industrial Chemical Co., Inc., located in Baltimore, Md. In the large columns shown in the background, the dehydrating process is continuous and the tail-boxes permit inspection and testing of the "run" at all times to insure complete conformance with the rigid specifications of manufacture.

Published Monthly by the U. S. Industrial Chemical Co., Inc.

USE OF BENZYLCELLULOSE IN MAKING LEATHER COATINGS

A foreign journal reports that investigations of the benzylcellulose collodions and varnishes have indicated their suitability for use in the manufacture of many kinds of leather. They are of special interest on account of their solubility in benzene-alcohol mixtures, stability, plasticity with heat, and strong adhesive properties.

They are graded according to their benzyl content; at high, medium and low viscosity.

Investigation of their characteristics showed favorable comparison with the cellulose acetates and nitrates in regard to solubility, film formation, viscosity, adhesiveness, resistance of film to acids and alkalis, cracking, bending, and tearing. They also compared favorably in dielectric and hygroscopic properties.

ANHYDROUS ALCOHOL USES EXPANDING IN FIELD OF SOLVENTS AND CHEMICALS

(*Continued from preceding page*)

of anhydrous alcohol with the usual ester solvents are stronger solvents than the straight esters as is shown by the following data:

Toluol Dilution Ratios of Usual Ester and Ester-Anhydrous Alcohol Blends

Solvent	Straight Ester	Ester plus Anhydrous Alcohol
Ethyl Acetate 85%	3.5	3.7
Amyl Acetate—Com'l	2.7	3.3
Amyl Acetate—Sec.	2.1	2.7
Butyl Acetate—Nor.	2.9	3.1
Butyl Acetate—Sec.	2.8	3.1

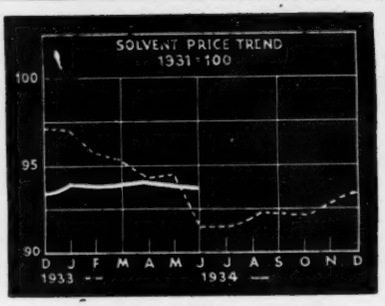
As a resin solvent, anhydrous alcohol will completely dissolve rosin, kauri, pontianac and manila; and all but the wax in elemi, mastic, shellac and dammar. Ester gum and cumar will dissolve in a mixture of anhydrous alcohol and 20-30% hydrocarbon or ester. Hard copals such as congo and zanzibar are soluble in anhydrous alcohol after a simple heat treatment.

Use as a reaction medium in the purification, extraction and crystalization of various chemicals is another important solvent use of anhydrous alcohol. Here, of course, its function is purely a mechanical one, as it does not enter into the chemical reaction itself.

As a chemical, anhydrous alcohol finds use in the manufacture of pharmaceuticals, fine chemicals and dyes. It is important in the fields of organic synthesis where the ethyl group is required.

Some chemical reactions requiring alcohol will not take place in the presence of water. Others go forward more rapidly, giving higher yields when water-free alcohol is used. In these cases, anhydrous alcohol is most desirable.

The U. S. Industrial Chemical Co., Inc., is equipped to supply industry with any gallonage of commercial anhydrous ethyl alcohol in convenient packages to fit individual requirements from single gallons to tank car quantities. U. S. I., for the convenience of the trade, offers also a group of anhydrous alcohol-ester solvent blends under the trade name of "Ansol." Descriptions and specifications of these products will be supplied to interested parties on request.



SOLVENT PRICE TREND

Beginning with this issue and continuing thereafter, the index number for prices of solvents and diluents will be based on prices as of the fifteenth of the preceding month and not the first of the current month as formerly. This change has been necessitated by an advancement in the publication date.

No changes in prices for major solvents and diluents were recorded between June 1st and 15th. Renewals of contracts for the third quarter were generally accepted at prices prevailing during the preceding three months' period. The index number for June remains at 92.53.

TECHNICAL DEVELOPMENTS

Ethylene gas has been reported to offer an effective medium for removing from walnuts their outer husks when the latter have failed to crack normally.

* * *

Clear lacquers have been developed suitable for use on flexible rubber and latex products designed for application before or after cure. Colored lacquers are also available for leatherette and molded goods.

* * *

Felt is bonded permanently to sheet metal by fusing a metal coating between the sheet and the felt layer so that the fibres of the felt are embedded in the coating, and will not separate under any conditions of temperature, moisture, friction or strain. One or both sides of the metal may be so bonded. Uses of the material include sound and temperature insulating construction, air conditioning equipment, automobile and airplane bodies, instrument and office appliance bases, etc.

* * *

Protection of automobile enamel finishes during shipment is accomplished by spraying with rubber latex. The film is sprayed sufficiently thick to permit salvaging the rubber by stripping it off at destination. Another use of rubber latex films is to protect living plants during winter storage, shipment or transplanting, by spraying or immersion. Loss of moisture is prevented, and the plants kept alive.

* * *

A new process of manufacturing patent leather is covered by a U. S. Patent. Over a coating or coatings of japaner's oil composition, a coating of modified polyhydric alcohol-polybasic acid resin and drying oil is applied to the leather. The resin coating is then hardened by baking.

* * *

A new intermediate coating material for use as an undercoat which absolutely and completely stops "bleeding" is now being manufactured. Designed for use in refinishing such surfaces as stained woodwork, furniture, asphalt flooring, standpipes or any surface that bleeds into or discolors succeeding finishing coats, it may be painted, lacquered or enameled. It is not intended as a finish coat.

* * *

Printing inks and colors may now be manufactured with paraffin hydrocarbons containing a small amount of solvents such as those used in the lacquer industry according to claims of a recent French Patent. For example, benzine and 10 percent alcohol or ethylene glycol monoethyl ether are used instead of the usual benzol type hydrocarbons.

* * *

Protective coating for underground metal pipes is found to result from a mixture of an artificial resin and rubber in a homogeneous solution which is obtained by first mixing into the resin solution a finely ground filler like China clay and then adding the rubber dissolved in a tar oil. Such a mixture recently patented abroad is said to cover and adhere well to metal piping.

ta, Iowa Soap president, is "Citizen No. 1 of Burlington for '33, honor conferred by the American Business Club. . . . All toilet soaps (except shaving soaps and shampoos) have been placed under the grocery code.

Checking the Container Field

Continental Can has purchased property located at 235 South Cherokee st., in Denver, consisting of 3.4 acres of land and 2 modern buildings, suitable for can manufacturing. Since 1928, when the company acquired the can manufacturing business and machinery of R. Hardesty Manufacturing Co., operations in Denver have been conducted on leased premises.

Machinery and equipment now on the property under lease, together with additional equipment, will immediately be installed in the newly acquired property.

Murphy Promoted

E. D. Murphy, Metal Package general sales manager for the past 14 years, has been elected a vice-president.

Somebody's Good Luck

To the worst drought in years must be added in the farmers' list of woes the worst chinch bug infestation in a decade or more. Oil and cyanogen compounds are being used in large quantities. Wheat and oats have been riddled and the bugs are now migrating into corn.

Polish Code's Budget

Furniture and floor wax and polish manufacturing industry code authority has filed a budget of $18,720, covering year started May 1.

Pick Green And Win

Green is expected to be a popular color with those redesigning packages this fall.

Glass manufacturing employment and payroll figures continued in April their 15-month climb. Number employed was within 5 points of the '23-'25 average.

Textile and Tanning Chemicals

Quiet June Days

Last week in June developed a slight improvement in the call for dyestuffs and tanstuffs. Textile industry showed some indications of becoming more active and the shoe centers were busier although operations in both industries are far below the pace set earlier in the year, nor is the immediate outlook overly encouraging.

Zinc dust prices were up slightly as the metal market went into higher ground, egg albumen was off 2c, a number of tanstuffs were down from May price levels. Bichromate prices were steady and shipments were fair.

Sulphonated Oil Code Signed

NRA Administrator Hugh S. Johnson June 30 approved a code of fair competition for the sulphonated oil manufacturing industry. Code, which became effective July 9, specifies, with certain exceptions, a basic work week of 40 hours and a limitation of 8 hours a day. Exceptions are made in the case of employees engaged in emergency maintenance and repair work, who shall be paid time and one-half for all hours worked in excess of the maximum. Also excepted are outside salesmen and managers, executives and supervisory or technical employees who receive $35 or more a week. Engineers, firemen, shipping clerks, and truckmen are permitted to work not more than 44 hours a week; and watchmen are allowed a weekly maximum of 56 hours.

Code establishes a minimum wage of 45c an hour for common, unskilled labor, with a minimum of $15 a week for clerical and office employes. Under code, working hours are reduced, some 23% below those of '29, and minimum wage rates are increased proportionately.

Important Price Changes

ADVANCED		
Divi divi, ...	$40.00	$35.00
Zinc dust, c. l.	.0640	.0630
DECLINED		
Albumen, edible egg..	$0.82	$0.83
Mangrove bark	26.00	28.00
Myrobalans, R 2's....	16.00	16.25
S 1.....	26.00	27.50
Valonia beards	39.50	40.00

With The Specialty Houses

W. H. & F. Jordan, Jr., Mfg. Co., Philadelphia, is marketing "Duosolve" a water softener and for such processes as scouring, boiling-off, dyeing and finishing. Descriptive booklet is available. . . . Textile Chemical Products, Greensboro, N. C., is now offering complete line of sizes, oils and chemicals used in the textile industry. W. L. Gaffney, southern soap authority, has been added to the staff. Eastman Gelatin has appointed "Texchem" a distributor of technical gelatins. Textile Chemical has also opened a N. Y. City office at 415 W. 28 st., C. H. Harris, well known in the silk field, in charge. . . . E. W. Bell will handle promotion work on "Calgon" for the Buromin Co. of Pittsburgh for the New England textile field.

Where Rayon Was Headed

Du Pont rayon president, Leonard A. Yerkes, described conditions prevailing in rayon in '31 as being such that it had moved to the basement and was on its way out into the gutter, when testifying in the current Federal Trade Commission hearings in which the latter charges producers with price fixing. Counsel for the manufacturers bitterly fought attempt by Commission counsel, Edward L. Smith, to question Mr. Yerkes as to whether all companies issued new price lists ef-

Hinde & Dauch's booth at the 19th Annual International Convention and "Inform-A-Show" of the National Association of Purchasing Agents, Cleveland June 18-21 was one of the most popular "spots"

Vernier gave Science
more than a measuring device

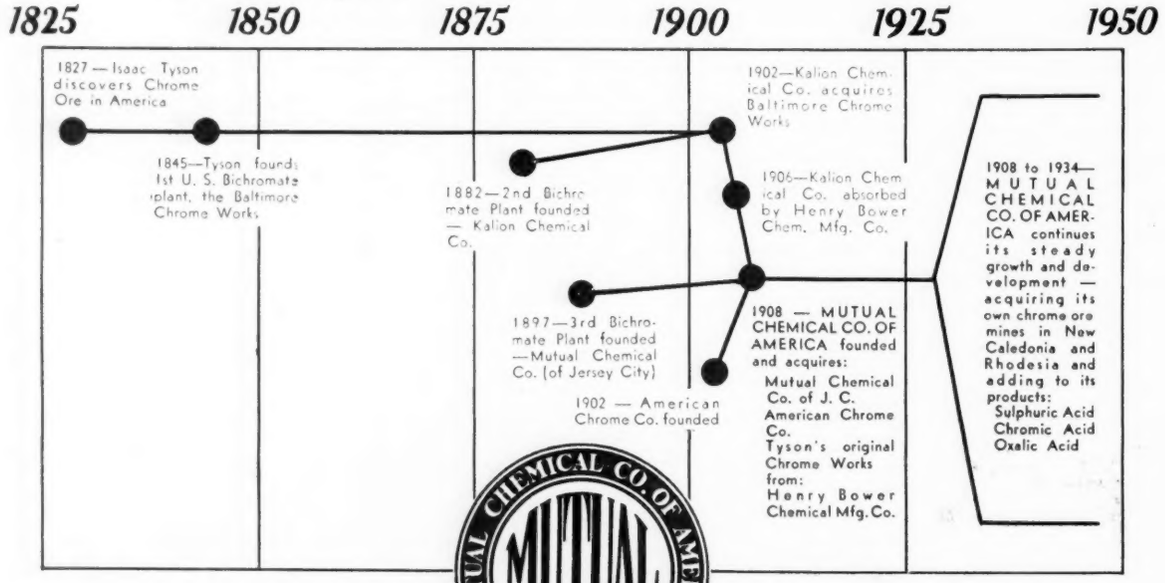
When in 1631 Pierre Vernier described his noted caliper, he gave science something besides a new implement. He opened avenues for further scientific advance, and the means for greater accuracy in the measurement of linear and angular magnitudes.

Similarly, in 1827 when Isaac Tyson recognized as Chrome Ore, a couple of ordinary looking stones in the Baltimore market place, an important new opportunity was opened for industrial America.

Tyson was the founder of the chemical chrome industry in the United States.

After mining and exporting the Ore for a number of years, in 1845 he formed the Baltimore Chrome Works, the first Bichromate plant in the country.

Mutual Chemical Co. of America (direct descendant of Tyson's original enterprise) became heir to the accumulated experience and technique developed over a hundred year period and today operates the country's largest Bichromate plant, in Baltimore on the site of Tyson's original factory.



Bichromate of Soda
Chromic Acid

Bichromate of Potash
Oxalic Acid

FACTORIES
Baltimore Jersey City

MINES
New Caledonia South Africa

The History of Mutual is the Chemical History of Chrome in America

fective Oct. 23, '31, 48 hours after the now famous Union Club gathering of rayon executives. Commission alleges conspiracy was hatched at this meeting, but the witness emphatically denied price discussion did take place, and stated that meeting was entirely devoted to a general discussion of conditions.

Dyers In New Positions

Carl Luther has accepted the position as overseer of dyeing in the Malden Spinning & Dyeing, Malden, Mass. . . . William O'Haire has taken charge of dyeing and finishing for the Shawmut Woolen, Stoughton, Mass. . . . George A. Phillips has charge of finishing for the Holden Leonard Co., Bennington, Vt. . . . Frank Supple is now overseer of dyeing in the Seymore Hat Works, Beacon, N. Y. . . . Leslie L. Walmsley has resigned from the Whitestone Dye Works, Maspeth, L. I., N. Y., and has accepted a position as overseer of plush dyeing with the Manhattan Print Works, Passaic, N. J. . . . William E. Tobin is now in charge of the dyeing for the Hudson River Woolen Mills, Newburgh, N. Y. . . . Victor Tessier has resigned his position as dyer with the Hudson River Woolen Mills, Newburgh, N. Y., and has accepted a similar position with the Lebanon Woolen Mills, Lebanon, N. H.

Consumer and Silk Weighting

Peter Van Horn, chairman of the Silk Textile Code Authority, has announced that a special committee of technical experts of the National Federation of Textiles, Inc., successor to the Silk Association of America, Inc., is studying the problem of weighted silk from the consumer angle.

Exempted

NRA has approved an order granting to the members of the tanning extract industry exemption from article 3, section 1 (c) of its code, which required that "all other laborers, mechanical workers, or artisans employed in any plant" shall work an average of not more than 8 hours in any one period of 2 consecutive weeks, but not more than eight hours in any one day. Mr. Johnson's order, which is to be in effect pending determination of a request for amendments, provides that extra time may be worked where the absence of relief workers would result in a shutdown.

Order provides further that additional hours may be worked in cleaning evaporators, autoclaves, and leaches, and in ordinary repairs and adjustments, in cases where such equipment is shut down for a period of not less than 8 consecutive hours, provided such work shall not be in excess of 8 hours in any one week.

At a hearing of the tanning extract industry in Washington, recently, definition of the industry under the code was extended to include extract liquefiers or dissolvers. This will bring added firms under the extract administration. Considered also was a suggestion by the legal division of the NRA that the group adopt a standard form of assessment payment with the object of bringing about uniformity of all budgets.

Tubize and Labor

Tubize's Hopewell plant shut down June 30 because of labor trouble. Appeals to the State authorities brought protection for 50 men engaged in cleaning out nitrocellulose in the machines.

Fall Silk Colors

Fall silk colors have just been released by the Textile Color Card Association to its members. Association working with the Official Millinery Color Conference Committee has made 18 color recommendations for the '34 Fall season.

Extract Industry Complains

Code authority of the tanning extract industry has filed complaint "that Quebracho extract is being imported in such substantial quantities, and in such increasing ratio to domestic production, and on such terms or under such conditions as to render ineffective or seriously to endanger the maintenance of the code of fair competition approved Mar. 29, '34."

Gums, Waxes, Shellac

Are The Fireworks Over?

Shellac prices declined in June in the face of but moderate demand. Speculative angle to the situation remains main topic of conversation (CHEMICAL INDUSTRIES, June, '34, p. 544) among market factors in the country. Stocks in London as the month closed totaled the astonishing figure of 235,079 packages against 36,594 packages a year ago. May deliveries did not reach 4,000 packages and the international market is in a state of extreme uncertainty with such tremendous stocks available. While the current crop may be smaller than is expected it is difficult, those following the market closely in this country state, to see where the surplus stocks can be sold without considerable price sacrifices. Question of a future market in this country is still very much in an uncertain stage.

Both the gum and wax markets were quiet in June with buying largely of a routine nature. Carnauba seems to be in a particularly firm position. Camphor prices were down slightly.

Imports of shellac in the 1st quarter of 1934 showed an expansion of 65% by volume and more than double in value in comparison with the same quarter for 1933.

	Pounds	
	First quarter, 1933	First quarter, 1934
Shellac, garnet and other unbleached	298,774	102,335
unbleached orange	1,615,200	2,713,045
bleached	29,928	194,951
Lace, crude	1,632,556	2,446,499
Totals	3,571,458	5,458,830

Serious and Otherwise

American Gum Importers' Association, at its quarterly meeting held June 12 at the Westchester-Biltmore Country Club, heard Dr. A. Mantell, Pratt, on research on natural gums for varnishes. Golf prize winners included Louis Gillespie, Gillespie-Rogers-Pyatt; Joseph Deegan, and P. A. Bussehaert, of P. A. Busschaert Co.; W. A. Patterson, of G. W. S. Patterson & Co.; and H. E. Hendrickson, S. Winterbourne & Co.

Important Price Changes

ADVANCED		
Bayberry	$0.26	$0.25
Japan	.06½	.06
DECLINED		
Carnauba, No. 1 yellow	$0.31½	$0.32
No. 3 chalky	.18	.19½
Spermacetti, blocks	.18½	.19
Cakes	.19½	.20

Litigation

Catalin* has filed suit against Catalazuli Manufacturing, also Erich Heidenbluth, alleging infringement of certain patents involving the manufacture of cast synthetic resins. Catalazuli is located at College Point, N. Y. City. Patents in question are the same ones on which Marblette Corp. and Joanite Co. have recently taken out licenses from Catalin.

Rustless Iron Winner

Rustless Iron was declared winner recently when The Federal Court of Appeals, 4th Circuit, Asheville, N. C.,

* American Catalin Corp.

affirmed a decree of the District Court, Maryland, in a suit of American Stainless Steel and Electro Metallurgical against Rustless Iron, holding that the patents involved are invalid. Rustless Iron was sued for infringement.

Hubbell vs. Cyanamid

Jesse Hubbell, Fanwood, N. J., former Cyanamid research chemist, and the Calcyanide Products Corp., N. Y. City, has entered suit against Cyanamid for $500,000 alleging infringements of patents for the manufacture of a fumigant. He claims ownership of patents and it is stated that the Calcyanide Products is a licensee. He asks damages over a period of 13 years, claiming that he perfected his invention while in Cyanamid employ and that he offered his processes to the company but it did not exhibit "any real interest in the invention." Later he alleges he was discharged and the infringements, he claims, have continued since after that time.

Carbide vs. U. S.

Department of Justice has filed a bill in equity on behalf of the U. S. against Union Carbide & Carbon Corp. and its subsidiaries, in the U. S. District Court at Charlestown, W. Va., for the purpose of requiring Electro-Metallurgical, a subsidiary, to take out a license under the Federal Water Power Act to continue the construction and subsequent operation of a dam crossing New River, W. Va. Bill contends that the New and Kanawha rivers are navigable waters and therefore the government should have control of all construction that interferes with or affects the flow of these streams.

Fraud Alleged

Charging 8 officials of American Commercial Alcohol with fraud, a suit was disclosed June 26 when N. Y. State Supreme Court Justice Salvatore A. Cotillo rendered a decision granting a motion of the plaintiff to strike out part of the answers of the defendants. Suit was instituted by Arthur Frank, a minority stockholder, on behalf of himself and other stockholders of the corporation.

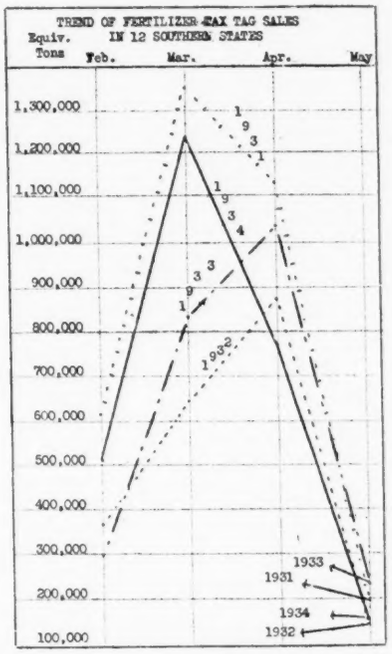
A Fall Case

Argument on injunction suit of Eastern Manufacturers, Inc., against Colgate-Palmolive Peet Co. will be heard in U. S. District Court at Wilmington, next fall at a date to be fixed later. Testimony in the case was concluded May 31. Suit concerns patents.

Fertilizers

Unsettled, K & N; Higher, P

Fertilizer trade interest centered in the peculiar situation in potash (reviewed in detail on page 49). Over in Zurich, if cable advices are correct, the synthetic and natural producers of nitrogen have failed to reach a satisfactory basis of agreement on allocation of markets. It is expected, however, that the conversations will be renewed shortly and at the moment it would appear quite unlikely that any major warfare is "in the cards."



Nat. Fert. Association

Phosphate rock prices were advanced 35c a ton last month and super-phosphate was "upped" 50c a ton. Resale lots of sulfate of ammonia continue to dog the market and quotations of $23-$24 a ton are mentioned. Some talk existed in the trade of 1st hands officially recognizing the lower levels. Chilean nitrate prices were extended indefinitely in the last days of June at unchanged levels.

Producers of fertilizer materials report specially good foreign business in the past 3 months due, of course, to a large extent to the currency situation.

Sales of fertilizer tax tags for May in 12 Southern States were 33% smaller than the sales for May, '33, but were slightly higher than the sales for May, '32. In the 5 Midwestern States May sales were 21% smaller than sales for May, '33, but were 39% larger than the sales for May, '32. During 1st 3 months of the calendar year monthly sales for '34 were much larger than the comparable months of '33. During the last 2 months sales have been smaller than those for the corresponding months of '33. Four of the 12 Southern States had larger sales in May than for May, '33. Florida sales were 31% larger than a year ago, Mississippi sales 21% larger, and Tennessee sales 4% larger. With the exception of Florida sales for the month of May in Southern States usually represent but a small part of the entire year's sales. In the Midwest, Illinois sales were 20% larger than for May, '33, Indiana sales were 17% smaller, and the sales for Kentucky and Missouri about 30% smaller than those for May, '33.

Important Price Changes

ADVANCED		
Blood, dried, Chgo....	$2.35	$2.00
Imported	2.85	2.75
Phosphate rock, Florida, all grades, ...35c a ton		
Superphosphate, 16%..	8.50	8.00
Run of pile	8.00	7.50
Tankage, Chgo., first grade	2.00	1.80
DECLINED		
Nitrogenous material, East	$2.40	$2.50

U. S. Recovers Rock Trade

U. S. phosphate rock exports, after touching low point in '32, recovered in '33, and since Jan. 1, gains have been maintained, aided by low dollar exchange. First quarter '34 shipments totaled 211,500 tons ($1,050,000) against 165,250 tons ($783,600) in the same quarter of '33. Exports for all of '33 totaled 828,059 tons ($3,544,300) compared with 613,000 tons $2,796,000) in '32. European countries are still our best customers, though Japan has become our outstanding single market, buying 157,362 tons ($485,520) in '33, a considerable gain over '32. Russia, formerly a small importer, furnished almost 9% of the world total in '33, and ranked 4th—a place held in recent years by Algeria, according to C. C. Concannon, chief of the chemical division, Bureau of Foreign & Domestic Commerce.

Reasons for poor phosphate rock exports in '32 include: generally depressed conditions throughout the world and specially unsatisfactory agricultural conditions; further expansion in mining activity in other countries (particularly in North Africa); and finally the value of the dollar measured in depreciated foreign currency. Devaluation of the dollar, better conditions generally, and the concluding of an international agreement

between producers (CHEMICAL MARKETS, Sept. '33, p. 259; also CHEMICAL INDUSTRIES, June, '34, p. 551) have aided industry's recovery.

V.-C. Finally Elects

Lynn Ivey, V.-C. vice-president and general counsel, was elected president June 19, succeeding George A. Holderness. This was the 1st meeting held by the board of directors since the Virginia Supreme Court decision placed control in the hands of George S. Kemp and his associates. Mr. Ivey's election culminated a contest that has been waged bitterly between factions of the directors for nearly 2 years.

Directors elected Spencer L. Carter, 1st vice-president in charge of operations; M. S. Purvis, vice-president in charge of sales; H. E. Perry, treasurer in charge of credits and collections; P. C. Smith, secretary; George G. Osborne, assistant secretary and assistant counsel, and L. W. Dunn, assistant treasurer.

Mr. Holderness, who served as president nearly 2 years, had been 1st vice-president of the company. He was chosen president after the defeat of a proposal to merge V.-C. with Armour Fertilizer. George H. Kemp led the fight against the merger and was elected a director.

As vice-president and counsel, Mr. Ivey advised the directors that the 7% prior preference stockholders had the right to elect a majority of one of the board of directors, and that this charter right was not lost incident to the purchase by the corporation of $3,000,000 of its preference stock as investment.

It was contended by Alfred Levinger of New York, a director, that the prior preference group had lost its voting priorities. Mr. Levinger 1st obtained a temporary injunction from Chancery Court restraining Mr. Kemp and 7 other directors from taking office.

Judge Moncure made the injunction permanent, an appeal was noted, and the State's highest court last month sustained Mr. Kemp's position, dissolved the injunction and dismissed the case.

Another Kind of Recovery

Bayless W. Haynes (Wilson & Toomer president) suffered an attack of appendicitis while in N. Y. City and is at the French Hospital. . . .Elmer Huebeck, Davison Chemical, is another appendix sufferer now on the way to recovery.

May Fertilizer Tag Sales

	Equivalent tons *							
	May				January-May			
	P.C. of				P.C. of			
South—	1933	1934	1933	1932	1933	1934	1933	1932
Virginia†	96	27,256	28,308	25,782	108	236,640	218,952	201,621
North Carolina	89	42,473	47,591	49,805	97	796,809	819,248	625,648
South Carolina	19	5,937	31,925	16,604	101	522,247	519,812	419,302
Georgia	2	684	41,112	5,803	139	530,986	381,432	354,601
Florida†	131	40,954	31,347	35,289	125	196,836	157,953	174,666
Alabama	41	10,950	26,400	3,200	131	350,050	266,700	201,300
Mississippi	121	10,162	8,377	3,600	193	157,697	81,772	83,000
Tennessee†	104	14,372	13,818	11,882	119	75,553	63,251	52,276
Arkansas‡	68	1,700	2,500	2,248	195	40,820	20,935	17,198
Louisiana†	98	1,464	1,500	450	155	55,175	35,607	32,104
Texas†	100	1,085	1,082	980	178	48,315	27,090	29,598
Oklahoma	..	5	.....	.....	243	4,680	1,925	2,875
Totals, South	67	157,042	233,960	155,643	116	3,015,808	2,594,677	2,194,189
Midwest—								
Indiana	83	14,800	17,906	10,281	180	72,425	40,228	44,700
Illinois	120	2,319	§1,934	§1,339	115	§14,585	§12,699	§13,658
Kentucky	69	8,404	12,160	7,281	110	51,098	46,297	50,075
Missouri	69	802	1,155	77	221	§15,992	7,243	13,972
Kansas	..	.....	5	3	273	785	288	1,387
Totals, Midwest	79	26,325	33,160	18,981	145	154,885	106,755	123,792
Grand totals	69	183,367	267,120	174,624	117	3,170,693	2,701,432	2,317,981

* Monthly records of fertilizer tax tags are kept by State control officials and are slightly larger or smaller than the actual sales of fertilizer. The figures indicate the equivalent number of short tons of fertilizer represented by the tax tags purchased and required by law to be attached to each bag of fertilizer sold in the various States.

† Cottonseed meal sold as fertilizer included.

‡ Excludes 21,450 tons of cottonseed meal for January-May combined, but no separation is available for the amount of meal used as fertilizer from that used as food.

§ Revised.

United States Imports and Exports of Fertilizer and Fertilizer Materials By Classes—Total for All Countries—Long Tons

(Summarized by The Nat'l. Fertilizer Assn. from Dept. of Commerce Preliminary Reports)

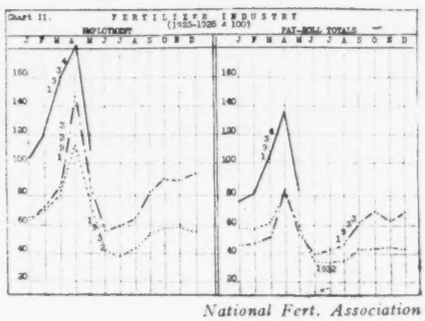
IMPORTS

	May			January-May		
	1934**	1933	1932	1934**	1933	1932
Ammonium sulphate	14,216	32,240	46,321	125,238	201,845	134,769
Ammonium-sulphate-nitrate	0	0	0	0	0	75
Calcium cyanamide	3,417	2,968	4,581	51,526	38,130	32,084
Calcium nitrate	2,183	1,988	26	24,584	11,957	3,705
Guano	3,757	9,054	0	4,018	19,296	3,258
Dried blood	126	165	96	1,584	1,124	2,313
Sodium nitrate	39,321	8,431	37	245,404	11,524	44,307
Urea and calurea	679	1,086	775	3,297	3,669	2,671
Ammonium phosphates	725	133	*	4,561	524	*
Tankage	555	2,838	2,443	4,323	8,222	10,062
Castor pumace	1,452	*	*	4,770	*	*
Other nitrogenous	4,626	658	12,630	49,428	16,560	22,318
Total Nitrogenous Materials	71,057	59,561	66,909	518,733	312,851	255,562
Bone phosphates	2,888	2,122	1,737	8,605	12,309	15,376
Superphosphates	2,959	1,364	1,495	9,470	8,512	10,395
Phosphate rock	0	0	50	0	2,100	6,350
All other phosphates	0	0	188	27	808	1,915
Total Phosphate Materials	5,847	3,486	3,470	18,102	23,729	34,036
Muriate of potash	7,002	5,780	6,187	52,128	27,179	24,822
Kainite, 14%	671	1,810	2,476	14,795	16,886	31,851
Kainite, 20%	1,357	6,221	‡	47,794	9,837	‡
Manure salts, 30%	3,076	1,907	1,349	42,516	33,829	46,721
Sulphate of potash	3,562	4,625	2,251	16,748	12,630	8,922
Sulphate of pot. magnesia	858	407	*	12,262	2,288	*
Nitrate of potash	729	1,955	*	6,610	5,017	*
Other potash	55	9	16	181	299	272
Total Potash Materials	17,310	22,714	12,279	193,034	107,965	112,588
Nit-phos-& pot. fertilizers	37	227	30	912	1,378	773
Other fertilizers	9,472	15,097	2,058	20,325	39,398	15,586
Grand Total	103,723	101,085	84,746	751,106	485,321	418,545

EXPORTS

Ammonium sulphate	616	254	587	7,021	1,289	13,050
Other nitrogenous chemicals†	1,242	5,054	2,799	70,000	32,010	53,787
Nitrogenous organic waste	788	679	719	5,573	3,084	3,388
Total Nitrogenous Materials	2,646	5,987	4,105	82,594	36,383	70,225
High grade hard rock	4,353	1,365	2,606	38,108	12,373	37,955
Land pebble rock	98,269	50,374	72,960	341,925	268,005	286,279
Total Phosphate Rock	102,622	51,739	75,566	380,033	280,378	324,234
Superphosphates	3,139	678	1,260	13,083	2,791	6,888
Other phosphate materials	593	62	128	3,418	337	698
Total Phosphate Materials	106,354	52,479	76,954	396,534	283,506	331,820
Potash fertilizers	2,443	1,206	295	13,304	7,837	391
Concentrated chem. fertilizers	1,883	573	274	7,650	3,409	3,759
Prepared fertilizer mixtures	426	104	69	984	311	454
Grand Total	113,752	60,349	81,697	501,066	331,446	406,649

* Not previously stated separately. ‡ Included in kainite, 14%. † Chiefly domestic synthetic sodium nitrate. ** The IMPORT figures for 1934 represent the imports entered for consumption plus withdrawals from warehouses for consumption.



National Fert. Association

PARALDEHYDE

$(CH_3CHO)_3$

GRADES AVAILABLE—Tech. (90%); Refined (99%); U.S.P.

SOURCE—of acetaldehyde.

RAW MATERIAL—for manufacture of rubber accelerators, synthetic resins, quinaldine dyes, synthetic perfumes.

SOLVENT—for varnishes, waxes, resins.

LEATHER—for elimination of grease spots and plumping thin skins.

MEDICINE—U.S.P. grade—as a hypnotic, antispasmodic, and sedative.

CROTONALDEHYDE

$CH_3 - CH = CH - CHO$

NIACET PRODUCTS

Glacial & U.S.P. Acetic Acid
Acetaldehyde
Acetaldol
Acetal
Alum. Acetate
Alum. Formate
Crotonaldehyde
Crotonic Acid
Ethyl Crotonate
Iron Acetate
Methyl Acetate
Paraldehyde
Triacetin

SOLVENT—for oils, fats, waxes, resins, rubber.

RAW MATERIAL—for organic synthesis, quinaldine dyes, rubber accelerators.

OIL PURIFIER—for removing undesirable impurities from lubricating oils.

INSECTICIDE — for irritating agent causing insects to expose themselves to toxic vapor.

LACHRYMATOR — for tear gas, and detecting leaks in air or gas lines.

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PLUS CHARGES

Oils and Fats

The Index Points Down

A slight decline occurred in the May oils and fats price index as compiled by the Bureau of Raw Materials for American Vegetable Oils and Fats Industries. Average price index number of the 23 oils and fats was 71.6 for the month of May, as compared to 73 in April and 66.5 in May a year ago. For the month of May, '34, U. S. Dept. of Agriculture index for all farm commodities was 74, same as for April. Index numbers of the various oils and fats for the months of April and May, 1934, are as follows:*

	May, 1934	April, 1934
Castor oil	97.3	97.3
Corn oil	90.0	94.3
Cottonseed oil	73.2	77.4
Lard	38.6	43.5
Oleo oil	55.5	59.1
Peanut oil	69.2	68.2
Soybean oil	109.3	109.3
Chinawood oil	104.1	100.0
Coconut oil	38.3	38.8
Cod oil	100.0	89.5
Grease	57.0	53.5
Herring oil	41.2	41.2
Linseed oil	107.5	103.6
Menhaden oil	70.7	100.8
Olive oil	105.8	106.0
Olive oil foots	98.1	94.4
Palm oil	37.3	52.8
Palm kernel oil	39.0	44.0
Rapeseed oil	59.3	62.5
Sesame oil	78.9	74.1
Stearin, oleo	48.4	52.3
Tallow	50.8	50.6
Whale oil	103.4	103.4

Other Index Numbers

Price index number for cottonseed for the month of May, '34, was 101 as compared to 99 for the month of April, '34. Price index number of flaxseed increased from 92 in April to 97 in May, '34. Price index number of K grade rosin was 85.4 in May and the index for turpentine was 98.9.

Tung Oil Imports

April Hankow-U. S. tung oil exports to the U. S. totaled 4,674,000 lbs., compared with 6,324,000 lbs. for March and 8,768,000 lbs. for April, '33. Total exports of oil for April were 6,754,000 lbs., against 8,846,000 lbs. in March and 10,904,000 lbs. in April, '33. Shipments to Europe aggregate 1,280,000 lbs. in April, compared with 2,244,000 lbs. in March and 2,136,000 lbs. for April, '33. Of particular significance in the export trade during the month was the large quantity of 800,000 lbs. of oil forwarded to Shanghai.

Stocks of oil on hand at Hankow the end of April were estimated at 1,760 short tons whereas stocks at the end of the preceding month totaled 1,740 short tons. Exports to the U. S. for the 4 months ended April equalled 28,436,000 lbs., as compared with 38,600,000 lbs. in the like period last year.

Oil News Summarized

Spencer Kellogg (now celebrating 40th anniversary) is building a 1,000,000 bu. elevator at Des Moines. Company will shortly begin soy bean oil manufacture in that city. It is reported company will retire about $900,000 of 6% debentures at 101 on July 1. . . .For the 1st time in years June found no contracts for crude menhaden on the if-and-when-made basis. Producers are holding off for 20c while buyers' ideas are reported around 16c. Fishing so far has been fairly good, but the fish are small and yielding little oil, most of the catch being sold as scrap. . . . Falk & Co., Pittsburgh, has purchased 8 additional acres close to its Carnegie plant for future expansion. . . . H. W. Perry, head of the vegetable oil division of Balfour, Guthrie, N. Y. City, is on the Pacific Coast.

Trying For a Code

National Cottonseed Products Association convention, held in New Orleans early in June, was largely given over to discussion of a suitable code that would meet approval of NRA and various divisions of the industry.

Solvents

After several weeks of price stability the petroleum solvents' market, particularly in the Group 3 area, showed definite signs of weakness, and while no definite declines were announced, some factors were reported offering price concessions. Actual sales were reported as being rather small with buyers restricting purchasing to immediate requirements. With the entire petroleum picture very much an unknown factor the price trend of petroleum chemicals is shrouded in much doubt.

Important Price Changes

ADVANCED

None

DECLINED

Petroleum Solvents, (Group 3):		
Cleaners' naphtha..	$0.06¼	$0.06⅞
Rubber solvent ..	.06⅜	.06⅞
Stoddard solvent..	.05¼	.06⅜
Naphtha, V.M.&P.	.06¼	.06⅞

Royal Dutch and Nitrogen

Royal Dutch in its annual report states: "The nitrogen factories at Velsen, Holland (N. V. Mekog), and in California (Shell Chemical) continued in '33 to work at full capacity and the total production of ammonia and the nitrogen fertilizers derived therefrom found a ready market. Price situation of nitrogen fertilizers was still rather unsatisfactory.

"Owing to the depreciation of the dollar the position of the plant in California, especially in regard to export markets, has been appreciably strengthened. Considerable alterations have been made to the ammonium sulfate plant there, in consequence of which the cost price of this product will be lessened appreciably."

Cottonseed Products

	On hand August 1	Produced Aug. 1 to May 31	Shipped out Aug. 1 to May 31	On hand May 31
Crude oil, pounds—				
1933-1934	*51,269,417	1,241,408,300	1,217,700,037	*76,076,939
1932-1933	29,523,581	1,339,256,463	1,303,787,791	81,283,020
Refined oil, pounds—				
1933-1934	†676,331,574	‡1,097,188,831	.....	†805,215,897
1932-1933	628,420,148	1,146,289,500	.....	781,071,399
Cake and meal, tons—				
1933-1934	160,874	1,801,370	1,742,496	219,748
1932-1933	114,656	1,941,916	1,850,963	205,609
Hulls, tons—				
1933-1934	76,686	1,056,192	1,075,677	57,201
1932-1933	162,773	1,221,888	1,297,632	87,029
Linters, running bales—				
1933-1934	70,786	759,491	697,264	133,013
1932-1933	235,521	681,581	744,807	172,295
Hull fiber, 500-lb. bales—				
1933-1934	985	39,176	38,223	1,938
1932-1933	4,138	17,472	16,882	4,728
Grabbots, motes, etc., 500-lb. bales—				
1933-1934	3,216	36,021	33,205	6,032
1932-1933	15,250	24,270	30,692	8,828

* Includes 4,274,646 and 8,089,005 pounds held by refining and manufacturing establishments, and 14,320,860 and 11,605,760 pounds in transit to refiners and consumers August 1, 1933, and May 31, 1934, respectively.

† Includes 5,498,953 and 5,063,912 pounds held by refiners, brokers, agents, and warehousemen at places other than refineries and manufacturing establishments, and 12,642,917 and 2,994,322 pounds in transit to manufacturers of lard substitute, oleomargarine, soap, etc., August 1, 1933, and May 31, 1934, respectively.

‡ Produced from 1,192,475,875 pounds of crude oil.

Exports for Nine Months Ended April 30

		1934	1933
Oil, crude	pounds	14,224,516	31,711,479
Oil, refined	pounds	5,633,217	7,021,029
Cake and meal	tons of 2,000 pounds	72,474	142,899
Linters	running bales	131,717	124,763

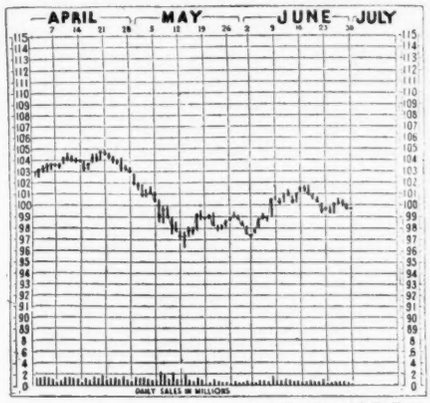
* Movement in June was mixed.

The Financial Markets

'34 Chemical Earnings

Twenty chemical and drug companies studied by the N. Y. Federal Reserve Bank showed 1st quarter earnings in '34 of 24.6 millions; in '33, 11.3 millions; in '32, 17.8 millions; and in '31, 26.3 millions.

Daily Record of Stock Market Trend



N. Y. Herald-Tribune

Stocks rose $623,480,103 in value in June; Chemical stocks increased $133,071,759 in value.

Armour Trading

Armour & Co.'s new common and new prior preferred stocks have been readmitted to trading on the N. Y. Curb on a when, as, and if issued basis in accordance with a plan set forth in a notice to stockholders dated May 28.

Hercules Declares

Hercules Powder has declared the regular quarterly dividend of $1.75 on the preferred, payable Aug. 15 to stock of record Aug. 3.

Heard In the "Street"

United Carbon's 2nd quarter earnings are expected to equal or exceed the $309,863 earned in the 1st quarter (equivalent to 76c a share on 370,127 shares of common after allowing for the 7% preferred dividend requirements) . . . National Lead with '34 sales slightly ahead of last year is likely to show much better earnings due to metal price advances and despite higher costs under NRA. Total sales of manufactured metal products (including pigment sales) are ahead 2% over '33.

A Remarkable Showing

Dow Chemical reports net profits for year ended May 31 as $3,577,651. This was equivalent to $5.39 a share on 630,000 shares of common, after deducting depreciation, taxes and dividends on preferred, and compares with $1,463,230 reported in previous fiscal year. Total current assets were $7,397,211; total current liabilities were $1,982,842 and general balance sheet total, $24,295,368.

OVER THE COUNTER PRICES

	Apr. 30		May 31		June 30	
Am. Hard Rubber	8	10½	8	11	7¾	11½
Canadian Celanese, com.	20½	20¾	20¼	22½	17½	19½
Canadian Celanese, pfd.	114	117	114½	118½	107	111
Dixon Crucible	57½	62	50	55½	53	57
Merck, pfd.	122½	126½	121½	125½	125	130
Tubize Chat., 7%, cum. pfd.	60¼	65	..	..	53¾	61
Worcester Salt	49	53	..	..	45	49
Young, J. S., pfd.	89	..	89½	..	98	..
Young, J. S., com	65¾	..	69½	..	70	..

Foreign Markets

London	April 30	May 31	July 2
British Celanese	12s 9d	11s 9d	12s 6d
Celanese	£5¾	£4¾	£5
Courtaulds	52s 7½d	49s 1½d	50s 4½d
Distillers	91s 9d	89s 6d	91s 9d
I. C. I.	36s 10½d	34s 7½d	35s 7½d
Unilever, ord.	23s 6d	22s 7¼d	21s 7½d
Un. Molasses	24s	.....	19s 3d
Paris			
Kuhlmann	611	...	...
L'Air Liquide	780	760	750
Berlin			
I. G. Farben	138	136	147
Milan			
Snia Viscosa	222¾	217½	232¼
Montecatini	138¼	134½	142½

Dividend Possibilities

If conditions continue favorable there is a possibility of dividends on the common of American I. G., Dr. Wilfrid Greif, chairman, stated at the annual meeting recently held.

American I. G. reported net profit after debenture interest, taxes, general and administrative expense for its last fiscal year of $1,320,325, against $1,245,621 in the preceding year. Debenture interest totaled $1,497,705 for the 12 months ended Mar. 31 last. Capital surplus was increased by $247,621 to a total of $6,932,055 during the year. Earned surplus amounted to $8,695,731 on Mar. 31. Stockholders elected the following directors: Herman Schmitz, Walter C. Teagle, Carl Bosch, Wilfrid Greif, Walter H. Duisberg, Edsel B. Ford, W. E. Weiss, D. A. Schmitz, William H. von Rath, William J. Quinn and Dr. Sanford D. Stockton, jr.

Dividends and Dates

Name	Div.	Stock Record	Payable
Abbott Labs.	$0.50	June 18	July 2
Abbott Labs. ext.	.15	June 18	July 2
Air Reductions.	$0.75	June 30	July 16
Allied Chem. & Dye pf	$1.75	June 11	July 2
American Home Prods.	$0.20	June 14	July 2
Atlas Powder pf	$1.50	July 20	Aug. 1
Canadian Industries pf	$1.75	June 30	July 16
Celanese 7% cum pt pf	$3.50	June 15	June 30
Celanese 7% cum pr pf	1.75	June 15	July 1
Chickasha Cotton Oil spec	$0.50	June 8	July 2
Colgate-Palmolive-Peet pf.	$1.50	June 9	July 1
Com. Solvents.	$0.30	June 1	June 30
Devoe & Raynolds A & B.	$0.25	June 20	July 2
Devoe & Raynolds A & B ext	.25	June 20	July 2
Devoe & Raynolds 1st pf	1.75	June 20	July 2
Devoe & Raynolds 2d pf.	1.75	June 20	July 2
Dow Chemical stock	50%	June 16	July 2
duPont com.	$0.65	May 31	June 15
Eastman Kodak, pf	$1.50	June 5	July 2
Eastman Kodak.	1.00	June 5	July 2
Freeport Texas pf	$1.50	July 12	Aug. 1
Glidden Co.	$0.25	June 11	July 2
Glidden Co. pf.	1.75	June 11	July 2
Hercules Powder	$0.75	June 14	June 25
Int'l Salt	$0.37½	June 15	July 2
Koppers Gas & Coke pf	$1.50	June 10	July 2
Mathieson Alkali	$0.37½	June 11	July 2
Mathieson Alkali pf	1.75	June 11	July 2
Merck pf	$2.00	June 18	July 2
Monroe Chemical pf	$0.87½	June 15	July 2
Monsanto Chemical pf	$0.87½	June 15	July 2
National Lead pf A	$1.75	June 1	June 15
National Lead com	1.25	June 15	June 30
National Lead pf B	1.50	July 20	Aug. 1
Penick & Ford	$0.50	June 1	June 15
Penn Salt Mfg.	$0.75	June 30	July 14
Pittsburgh Plate Glass	$0.35	June 9	July 2
Procter & Gamble 8% pf.	$2.00	June 25	July 14
Procter & Gamble 5% pf.	1.25	May 25	June 15
Spencer Kellogg	$0.30	June 15	June 30
St Joseph Lead.	$0.10	June 8	June 20
Texas Gulf Sulphur	$0.50	June 1	June 15
Union Carbide.	$0.35	June 1	July 2
United Carbon pf	$3.50	June 16	July 1
United Carbon.	.44	June 16	July 2
United Dyewood pf	$1.75	June 15	July 2
Vulcan Detinning pf	$1.75	July 10	July 20
Vulcan Detinning pf	1.75	Oct. 10	Oct. 20
Westvaco Chlorine pf	$1.75	June 15	July 2
Will & Baumer pf	$2.00	June 15	July 2

Price Trend of Chemical Company Stocks

	June 2	June 8	June 15	June 23	June 30	Net gain or loss	1934 High	1934 Low	1933 High	1933 Low
Allied	132¼	138¾	140½	139¼	131	—1¼	160¾	126½	152	70¾
Air Red	92¾	94½	99¾	49	98½	+5¾	106¼	91¾	112	47½
Anaconda	13½	15¾	16	14⅝	14¾	+1¼	17¾	13	22⅞	5
Col. Carb.	65	70⅜	74½	71½	71½	+6½			71½	23⅛
Com. Sol.	21¼	24⅛	24⅛	22⅜	22¼	+1	36¾	19¾	57¾	9
du Pont	82	90	124	88½	88⅝	+6⅝	103⅞	80	96⅜	32⅛
Mathieson	28¾	30x	33⅝	88½	32¼	+3⅞	40¾	28	46⅝	14
Monsanto	42	44	47½	49	51	+9			83	25
St. of N. J.	½	45¾	47⅛	43⅞	43⅞	+1⅜	50⅛	41⅛	47½	22¾
Texas Gulf S.	33⅛	35¼	34	33⅞	34	+ ⅞	40¼	30½	45¼	15¼
U. S. I.	38½	42¾	44⅛	40⅝	40¾	+2¼	64¾	37	94	13½

x Ex-dividend.

The Industry's Securities

1934 June Last	1934 June High	1934 June Low	1933 High	1933 Low	1932 High	1932 Low	Sales	Stocks	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1933	Earnings $-per share-$ 1932
June 30							Number of Shares						
NEW YORK STOCK EXCHANGE							1934	June					
98½	106¼	91¾	112	47½	63½	30⅞	113,600	10,000	Air Reduction	No	841,288	$3.00*	3.79	2.73
131	160¾	126½	152	70¾	88¼	42½	190,100	20,100	Allied Chem. & Dye	No	2,214,099	6.00	5.50	3.62
127½	129¼	122⅛	125	115	120†	96½	6,400	500	7% cum. pfd.	100	345,540	7.00	42.24	29.12
33½	36	25¼	35	7¼	15½	3½	145,800	4,600	Amer. Agric. Alcohol	100	315,701	None	p—1.61	—p3.86
33⅝	62½	32	89⅞	13	27	11	415,400	22,800	Amer. Com. Alcohol	20	260,716	None	4.56	3.01
31	34	26½	29¼	9¾	15½	7	58,600	3,800	Archer-Dan-Midland	No	541,546	1.00	1.82	q1.44
48¾	55½	35¼	39⅜	9	25½	7	57,900	3,300	Atlas Powder Co.	No	234,235	2.00	.74	—2.06
100½	101½	83	83⅛	60	79½	45½	4,270	260	6% cum. pfd.	100	88,781	6.00	8.38	.47
25	44⅞	22⅝	58⅞	4½	12⅝	1¼	815,000	52,700	Celanese Corp. Amer.	No	987,800	None	3.32	— .95
15½	18⅛	9⅜	22⅜	7	31½	10¼	572,200	55,800	Colgate-Palm.-Peet	No	1,985,812	None	— .57	— .74
85	92	68½	88	49	95	65	7,500	900	6% pfd.	100	254,500	6.00	1.51	.21
73⅝	77¼	58	71½	23⅛	41⅞	13½	227,600	27,700	Columbian Carbon	No	538,154	2.00	2.17	1.83
22¼	36¾	19¾	57¼	9	13¾	3½	2,021,000	82,600	Commer. Solvents	No	2,635,371	.60	.88	.51
65	84½	60½	90⅝	45⅜	55⅜	24¾	204,300	24,700	Corn Products	25	2,530,000	3.00	3.87	2.77
143½	145	135	145¾	117½	140	99½	5,200	700	7% cum. pfd.	100	243,739	7.00	46.02	35.05
46½	55⅛	29	33⅞	10	16¾	7	61,200	3,300	Devoe & Rayn. A	No	95,000	h1.00	3.82	—r1.00
88⅝	103⅞	80	95⅞	32⅛	59¾	22	1,036,900	137,400	DuPont de Nemours	20	10,871,997	2.60	2.93	1.81
121⅞	124½	115	117	97½	105⅛	80¾	3,500	5,200	6% cum. deb.	100	1,092,699	6.00	35.58	24.00
97½	101	79	89¾	46	87¾	35¼	139,200	17,400	Eastman Kodak	No	2,250,921	4.00	4.76	2.52
147	147	120	130	110	125	99	1,490	110	6% cum. pfd.	100	61,657	6.00	180.34	98.27
32½	52⅜	30¾	49⅜	16⅛	28⅝	10	212,200	53,300	Freeport Texas	10	784,664	2.00	3.01	2.75
135	160⅛	135	160⅛	97	...	...	1,900	200	6% conv. pfd.	100	25,000	6.00	156.73	...
24⅝	28⅜	15⅝	20	3¼	10⅜	3⅛	640,300	24,800	Glidden Co.	No	603,304	1.00	1.54	—s.06
101½	103	83	91½	48	76	35	8,395	1,190	Glidden, 6% pfd.	100	63,044	7.00	22.60	7.85
89⅞	96⅞	85	85⅞	65	...	...	29,500	4,100	Hazel Atlas	25	434,409	5.00	6.22	4.68
72½	75	59	68⅝	15	29½	13⅞	48,800	6,600	Hercules Powder	No	582,679	3.00	2.79	.24
122	124½	111	110⅛	85	95	70½	3,160	420	7% cum. pfd.	100	105,765	7.00	22.38	8.39
24½	30½	22⅛	85	24	40	7⅛	505,400	32,200	Industrial Rayon	No	600,000	1.50	3.01	.55
2¾	6⅛	2	5⅞	⅞	3½	¼	195,100	3,000	Intern. Agricul.	No	536,049	None	p—0.04	—p4.47
24	37¼	15	23½	5	15	3¾	25,200	200	7% cum. pr. pfd.	100	100,000	None	p—10.60	p—8.48
26	29¼	21	23¼	6¾	12½	3½	2,191,500	183,400	Intern. Nickel	No	14,584,025	None	.53	— .14
30½	32	21	27¾	13¾	23½	9¾	35,200	9,400	Intern. Salt	No	240,000	1.50	2.04	2.14
23	24½	15¾	22	7½	11	8	36,500	2,000	Kellogg (Spencer)	No	500,000	1.00	.98	—v.26
31½	43⅞	27⅜	37⅜	4⅜	9⅜	3¾	660,900	43,700	Libbey Owens Ford	No	2,559,042	1.20	1.64	— .13
27¾	35⅜	25¾	50	10¼	22	9	187,900	9,500	Liquid Carbonic	No	342,406	1.00	v1.05	—u129
32¼	40¾	28	46⅝	14	20⅞	9	373,900	27,100	Mathieson Alkali	No	t650,436	1.50	1.70	.86
51½	52	39	83	25	30¾	13⅜	121,900	21,100	Monsanto Chem.	10	864,000	1.00	2.57	1.18
156	160½	135	140	43¼	92	45	18,000	2,700	National Lead	100	309,831	5.00	6.98	3.15
143	143	122	128¼	101	125	87	2,700	500	7% cum. "A" pfd.	100	243,676	7.00	18.35	13.55
113¼	113¼	100½	109⅛	75	105	61	1,400	100	6% cum. "B" pfd.	100	103,277	6.00	30.45	15.45
8¼	13	6	11¾	1⅜	3¾	1½	114,800	3,700	Newport Industries	1	519,347	None	.05	— .68
76⅞	94	73½	96¾	31½	42¼	12	94,800	11,600	Owens-Illinois Glass	25	1,200,000	3.00	4.86	1.62
36½	41¼	33⅛	47½	19⅝	42¾	19⅞	187,400	28,300	Procter & Gamble	No	6,410,000	1.50	1.52	q1.26
113½	114	102½	110¾	97	103½	81	4,285	610	5% pfd. (ser. 2-1-29)	100	171,569	5.00	61.95	52.16
5	6¾	4⅛	7¼	1⅜	4⅜	1	73,600	7,600	Tenn. Corp.	5	857,896	None	— .11	— .89
34	43¼	30½	45¼	15¼	26¾	12	412,200	55,700	Texas Gulf Sulphur	No	2,540,000	2.00	2.93	2.33
42¼	50⅞	35⅞	51⅞	19¾	36⅜	15½	686,400	56,100	Union Carbide & Carbon	No	9,000,743	1.40	1.59	.98
45	46½	35	37¾	10¼	18	6⅝	162,400	24,400	United Carbon	No	370,127	1.60	1.39	— .05
40¾	64¾	37	94	13½	36¼	13¼	236,400	12,900	U. S. Indus. Alco.	No	391,033	None	3.56	.47
20½	31¾	18	36¼	7⅜	23¾	5¼	443,400	19,400	Vanadium Corp.-Amer.	No	366,637	None	—2.40	—4.36
3¼	5⅜	2⅝	7⅜	⅝	2⅜	½	188,800	2,900	Virginia-Caro. Chem.	No	486,000	None	p—5.06	p—5.68
18½	26	14½	26½	3⅜	11¼	3⅛	50,800	5,000	6% cum. pact. pfd.	100	213,392	None	p—5.54	p—6.96
81½	81½	59¾	63½	35⅜	69¾	20	3,600	1,100	7% cum. prior pfd.	100	60,000	None	p—12.71	p—7.83
18¾	27¼	14⅞	20½	5	12⅝	3	101,150	1,850	Westvaco Chlorine	No	284,962	.40	1.08	.79
NEW YORK CURB EXCHANGE														
18¼	22½	15⅛	16½	3¼	8½	1⅝	455,900	44,700	Amer. Cyanamid "B"	No	2,404,194	.25	.99	.14
3¼	4⅛	2⅞	4½	1	2⅛	¾	26,000	200	British Celanese Am. R.C.R.	243	.....	None	...	...
82	104¼	82	110	27	55	8	7,975	250	Celanese, 7% cum. 1st pfd.	100	144,379	7.00	32.24	.60
90½	95½	83	90	51	64¼	17	3,425	25	7% cum. prior pfd.	100	113,668	7.00	47.98	7.77
8	19	7¼	26⅞	2	5⅜	1½	15,300	900	Celluloid Corp.	15	194,952	None	—1.00	—3.79
12⅞	14⅜	10½	11⅝	4⅛	6⅞	4½	15,500	500	Courtaulds' Ltd.	1£	24,000,000	4½%	...	...
101½	102	69¼	78	30	39	21½	25,300	3,100	Dow Chemical	No	630,000	2.00	1.99	2.95
8¼	10¼	4	8	½	1½	¼	47,500	2,900	Duval Texas Sulphur	No	500,000	None	z.17	z.30
32½	37	19	19	8	...	...	9,900	1,600	Heyden Chem. Corp.	10	147,600	1.00	2.68	1.23
53	57½	39	39⅞	13	19½	12⅛	92,300	9,175	Pittsburgh Plate Glass	25	2,141,305	1.40	1.87	— .03
69¼	70¼	47¼	47	12⅞	35	17½	87,115	11,100	Sherwin Williams	25	635,583	2.00	y3.54	— .44
105	107¾	100	99	80	100⅛	75	1,380	40	6% pfd. AA. cum.	100	155,521	6.00	y20.78	4.52
CLEVELAND STOCK EXCHANGE														
101	102	70½	78	30	40	21½	6,640	260	Dow Chemical	No	630,000	2.00	1.99	f2.95
PHILADELPHIA STOCK EXCHANGE														
60	61¼	50¼	57	25¼	40	19⅞	1,225	150	Pennsylvania Salt	50	150,000	3.00	2.17	2.42

1934 June Last	1934 June High	1934 June Low	1933 High	1933 Low	1932 High	1932 Low	Sales	Bonds	Date Due	Int. %	Int. Period	Out-standing $
June 30							1934	June				
NEW YORK STOCK EXCHANGE												
102¾	103¼	93½	95	70½	80	62	848,000	60,000	Amer. Cyan. deb. 5s	1942	5	A. O.	4,411,000
98½	99	83⅞	89	64	80	54¼	2,955,000	330,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
9½	17¾	5	14⅛	2⅛	18	1	2,320,000	108,000	Anglo Chilean s. f. deb. 7's	1945	7	M. N.	12,700,000
81¾	88	61½	74⅞	37	60	34½	321,000	15,000	By-Products Coke Corp. 1st 5½'s "A"	1945	5½	M. N.	4,932,000
80½	79	62	65	38½	54⅞	32	186,000	15,000	Int. Agric. Corp. 1st. Coll. tr. stpd. to 1942	1942	5	M. N.	5,994,100
12½	19½	5⅛	14⅞	2½	15¼	¼	8,617,000	650,000	Lautaro Nitrate conv. b's	1954	6	J. J.	31,357,000
93⅞	98½	91	99⅛	87	97¾	67	395,000	16,000	Montecatini Min & Agric. det. 7's with war.	1937	7	J. J.	7,075,045
53½	74	52½	62	33¾	59	17	394,000	12,000	Ruhr Chem. 6's	1948	6	A. O.	3,156,000
82½	88¼	65½	76	50	66	39	122,000	15,000	Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
81	89½	62	81	34¾	75	30	1,084,000	110,000	Vanadium Corp. conv. 5's	1941	5	A. O.	4,261,000
NEW YORK CURB EXCHANGE												
103	104	101⅜	103½	101	103⅛	99	58,000	3,000	Westvaco Chlorine Prod. 5½'s	1937	5½	M. S.	1,393,000

* Plus 75c extra; † Years ended 5-31-32-& 33; h Plus 25c ended 5-31-32-& 33; j Plus 75c ended 5-31-32-& 33; k Plus 75c ended 5-31-32-& 33; m Last paid, no regular rate; p Year ended 6-30-32 and 6-30-33; r Year ended 11-30-32; s Years ended 10-31-32 & 33; t Before issue, rights; u Year ended 9-30-32; v Years ended 9-2-32 & 33; x Years ended 5-31-32 & 33; y Year ended 8-31-33; z Year ended 8-13-32.

The Trend of Prices

Better Than Anticipated

Business generally declined in June. How much was seasonal is an open question. Both retail and wholesale trade appeared to be ahead of last year and carloadings and electric output continued to show increases over the same period a year ago. This is encouraging for it must be remembered that the sharp thrust forward in business in '33 occurred in June. On the other hand steel activity declined sharply in the last 10 days of the month and most of the heavy production industries operated under curtailed schedules. The textile and rayon industries particularly reported extremely quiet conditions. Automotive production was off, according to preliminary survey, in June from the high level of the last 3 months, but was still being held at a satisfactory pace. Outlook for July is much poorer as several of the producers will be shut down for varying periods.

Commodity price movements were mixed. Hot weather and lack of rainfall has forced up grain prices and in many markets new highs for the current year were established.

The labor factor continued to be important although the last minute passage of the substitute for the Wagner Bill has brought about a brighter picture, at least for the immediate future.

In most directions industry appears reconciled to a period of inactivity during July and the 1st part of August, but the consensus of opinion seems to point to a strong belief that there will be a revival of buying on a large scale in September.

The *N. Y. Times* Index of Industrial Activity turned in an upward direction in the middle of the month after registering quite a loss from the May high point. The stock market continued to move in a rather listless fashion, although some improvement in prices did occur in the middle of the month. Most of the gains, however, were largely dispelled by the end of the month.

Factory employment in the manufacture of chemicals and related products showed a drop of 6.4% between April 15 and May 15, according to the records of the Bureau of Labor Statistics. At the end of the period employment stood 23.8% above the level for the corresponding date in '33. Payroll totals in factories in the chemical group decreased 4.3% during the month and stood 29.9% above the corresponding '33 level.

Bureau of Labor Statistics index number for factory employment in the chemical group of industries May 15 was 106.1 (100=1923-25 averages), compared with 113.3 for April and 85.7 for May, 1933. Bureau's index number (same basis) for payroll totals in chemical factories was 88.3 at May 15, compared with 92.3 for April and 68.0 for May, 1933. See this page for detailed statistics.

Month's Business Statistics

	May 1934	*May 1933*	*April 1934*	*April 1933*	*March 1934*	*March 1933*
Auto production	331,641	214,832	360,620	180,713	336,013	118,002
Bldg. contracts*‡	$134,445	$131,413	$131,413	$56,573	$178,346	$59,958
Failures, Dun & Bradstreet	977	1,909	1,052	1,921	1,102	1,948
Merchandise imports‡	$154,647	$106,869	$146,517	$88,412	$158,000	$132,938
Merchandise exports‡	$160,207	$114,203	$179,444	$105,217	$190,000	$108,015
Newsprint Production						
Canada, tons	242,539	171,776	216,507	147,759	210,129	137,078
U. S., tons	89,726	79,516	83,652	74,507	84,933	76,566
Newfoundland, tons	.....	.....	25,311	19,048	24,778	21,381
Total tons	.....	.....	327,086	242,493	321,187	236,503
Newsprint Shipments						
Canada, tons	.....	.....	220,573	161,266	207,197	140,694
U. S., tons	.....	.....	86,209	76,095	87,987	77,857
Total (U.S. & Canada)	.....	.....	306,782	237,361	295,184	218,551
Plate glass production, sq. ft.	7,764,477	8,922,434	8,629,381	4,679,776	9,926,850	4,881,322
Shoe production, pairs	.....	.....	33,308,152	27,630,000	.....	.....
Steel ingots	3,396,283	2,001,994	3,935,631	1,362,856	2,797,194	909,886
Steel activity, % of capacity	.....	.....	54.19	25.08	47.81	.....
U. S. consumption crude rubber, tons	43,012	44,074	44,947	25,928	47,097	18,047
Tire shipments	.....	.....	4,438,578	3,653,943	4,222,962	2,091,878
Tire production	.....	.....	4,769,980	3,123,494	5,180,122	2,037,899
Tire inventory	.....	.....	11,980,731	6,773,724	11,650,661	7,289,976
Textile Statistics						
Cotton consumption, bales	519,765	.....	512,703	470,359	543,690	495,183
Cotton spinning spindles oper.	25,891,366	24,571,498	26,450,750	23,416,680	26,503,876	23,488,143
Wool consumption (grease equival.)	28,012,944	.....	29,888,763	27,700,676	36,118,703	24,943,251
Indices of textile fiber consumption						
Textile group[a]	p 89	108	90	85	94	76
Cotton consumption[a]	95	113	97	91	97	86
Wool consumption[a]	63	105	68	66	71	48
Silk deliveries[a]	r 112	136	115	132	129	111
Rayon deliveries[b]	273	517	277	376	324	190
U. S. gasoline use, bbls.‡	.....	.....	32,735	30,176	29,733	28,227
Gasoline production, bbls.‡	.....	.....	34,875	33,355	33,355	32,362
Crude oil stocks, bbls.‡	.....	.....	534,350	356,499	354,000	341,708
Refined oil stocks, bbls.‡	.....	.....	231,176	248,558	232,821	247,840
Payroll totals†	67.1	42.7	67.3	.....	63.3	36.9
Factory employment†	82.4	62.6	82.3	.....	76.9	56.6
Dept. of Labor						
Chem. price index†	78.6	80.9	78.6	79.5	79.0	79.3
Fert. price index†	66.4	66.8	68.7	62.9	69.5	61.9
Mixed fert. price index†	73.2	63.1	72.7	60.0	72.6	60.1
Chemical Employment						
Dept. of Labor						
Chem. emp.†	111.2	75.4	110.8	72.7	107.7	73.7
fert. emp.†	111.8	84.9	181.5	148.1	160.4	85.0
Paints & varnish emp.†	107.4	83.8	102.6	76.4	98.4	74.1
Rayon emp.†	267.7	246.9	319.0	223.7	321.9	238.4
Soap emp.†	102.3	83.5	104.5	81.8	103.1	81.6
Turpentine & rosin†	102.4	71.9	101.2	63.5	101.4	67.5
Chemical payrolls†						
Dept. of Labor						
Chemical†	94.4	62.8	95.8	58.5	89.1	59.3
Fertilizer†	84.0	52.3	132.1	84.5	107.3	51.7
Paint & varnish	87.9	67.1	83.0	56.5	77.1	50.3
Petroleum refinery†	92.7	80.2	92.0	78.6	92.0	79.5
Rayon†	191.2	149.1	221.3	130.6	218.2	144.9
Soap†	87.1	68.9	88.8	67.1	88.4	66.8
Turpentine & rosin†	51.4	31.2	53.7	26.4	46.2	28.9
Chemicals & Related products						
Exports‡	$7,335	.....	$7,840	.....	$8,848	.....
Imports ‡	$5,862	.....	$8,509	.....	$7,366	.....

* 37 states, F. W. Dodge Corp.; ‡ 000 omitted; † Dept. of Labor, 3-year average 1923-1925=100.0. This represents a change for previously these indices were based on 1926=100; [a] Fed. Res. Board Indices, adjusted for seasonal variation; [b] Textile Organon Index, actual deliveries index; [p] preliminary.

Weekly Business Statistics

Week Ending	—Carloadings— *1934*	*1933*	*% Inc.*	—Electrical Output— *1934**	*1933**	*% Inc.*	*Jour. of Com. Price Index*	—National Fertilizer Association Indices— *Metals*	*Fats & Oils*	*Chem. & Drugs*	*Mixed Fert.*	*Fert. Mat.*	*All Groups*	*Labor Dept. Chem. & Drug Price Index*	*% Steel Activity*	*Fisher's Index Purch. Power*	*N. Y. Times Indexes Bus. Act.*
June 2	578,541	512,974	12.8	1,575,828	1,461,488	7.8	76.2	83.9	50.2	93.2	76.6	65.9	72.0	75.3	57.4	132.0	84.6
June 9	615,565	569,157	8.2	1,654,916	1,541,713	7.3	75.5	83.9	50.2	93.2	76.6	65.9	72.0	75.4	56.9	131.8	84.6
June 16	617,649	592,759	4.2	1,665,358	1,578,101	5.5	76.0	83.3	51.5	93.2	76.9	65.9	72.1	75.4	56.1	129.1	85.3
June 23	621,872	609,627	2.0	1,674,566	1,598,136	4.8	76.7	83.8	51.4	93.2	76.9	65.9	72.0	75.5	44.7	128.2	85.5
June 30	644,572	641,730	0.4	1,688,211	1,655,843	2.0	75.9	...	...	...	...	...	...	...	23.0	128.3	...

*kwh., 000 omitted.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1933 Average $1.56 - Jan. 1934 $1.37 - June 1934 $1.29

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Acetaldehyde, drs 1c-1 wks..lb.	...	.16	.16	.21	.18½ .21
drums, c-l, wks.....lb.	...	.14	.14	.16½	... ...
Acetaldol, 95%, 50 gal dr. wks	.21	.25	.21	.31	.27 .31
Acetamide .....lb.	.38	.43	.40	1.35	.95 1.35
Acetanilid, tech, 150 lb bbl..lb.	...	.26	...	.26	... .26
Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.21	.25	.21	.25	.21 .25
Acetin, tech drums.....lb.	.30	.32	.30	.32	.30 .32
Acetone, tanks.....lb.	...	.10	...	.10	.08 .10
Acetone Oil, bbls NY....gal.	1.15	.25	1.15	.25	1.15 1.25
Acetyl Chloride, 100 lb cby.lb.	.55	.68	.55	.68	.55 .68
Acetylene Tetrachloride (see tetrachlorethane)					
Acids					
Acid Abietic	.06¾	.07	.06	.07	.06 .12
Acetic, 28% 400 lb. bbls c-1 wks .....100 lb.	...	2.66	2.66	2.91	2.65 2.91
Glacial, bbl c-1 wk..100 lb.	...	9.13	9.13	10.02	9.14 10.02
Adipic	.72	.72	.72	.72	.72 .72
Anthranilic, refd, bbls.....lb.	.85	.95	.85	.95	.85 .95
Technical, bbls.....lb.	.65	.70	.65	.70	.65 .70
Battery, cbys .....100 lb.	1.60	2.25	1.60	2.25	1.60 2.25
Benzoic, tech, 100 lb bbls.lb.	.40	.45	.40	.45	.35 .45
Boric, powd, 250 lb bbls...lb.	.0425	.05	.0425	.05	.0425 .05
Broenner's, bbls.....lb.	1.20	1.25	1.20	1.25	1.20 1.25
Butyric, 100½ basis cbys.lb.	.80	.85	.80	.85	.80 .85
Camphoric .....lb.	...	5.25	...	5.25	... 5.25
Chlorosulfonic, 1500 lb drums wks. .....lb.	.04½	.05½	.04½	.05½	.04½ .05½
Chromic, 99¾%, drs....lb.	.13½	.15½	.13½	.15½	.11½ .14¼
Chromotropic, 300 lb bbls.lb.	1.00	1.06	1.00	1.06	1.00 1.06
Citric, USP, crystals, 230 lb. bbls. .....lb.	.28	.29	.28	.30	.29 .30
Cleve's, 250 lb bbls.....lb.	.54	.54	.52	.54	.52 .54
Cresylic, 95%, dark drs N Y .....gal.	.54	.56	.50	.56	.38 .50
97-99%, pale drs NY..gal.	.59	.61	.55	.60	.40 .55
Formic, tech 90%, 140 lb. cby .....lb.	.11	.13	.11	.13	.10½ .13
Furoic, tech, 100 lb drums.lb.	...	.35	...	.35	... .35
Gallic, tech, bbls.....lb.	.60	.70	.60	.70	.60 .70
USP, bbls.....lb.	...	.77	.74	.77	... .74
Gamma, 225 lb bbls wks..lb.	.77	.79	.77	.79	.75 .79
H, 225 lb bbls wks.....lb.	.65	.70	.65	.70	.60 .70
Hydriodic, USP, 10% soln cby .....lb.	.50	.51	.50	.51	.50 .51
Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.45	.48	.45 .48
Hydrochloric, CP, see Acid Muriatic					
Hydrocyanic, cyl. wks....lb.	.80	.90	.80	.90	.80 .90
Hydrofluoric, 30%, 400 lb bbls wks.....lb.	...	.07	...	.07	.06 .07
Hydrofluesilicic, 35%, 400 lb. bbls wks.....lb.	.11	.12	.11	.12	.11 .12
Hypophosphorous, 30%, USP, demijohns .....lb.	.75	.80	.75	.80	.75 .80
Lactic, 22%, dark, 500 lb. bbls. .....lb.	.04	.04½	.04	.04½	.04 .04½
44%, light, 500 lb bbls..lb.	.11½	.12	.11½	.12	.11½ .12
Laurent's, 250 lb bbls.....lb.	.36	.37	.36	.37	.36 .37
Linoleic .....lb.	.16	.16	.16	.16	.16 .16
Maleic, cry. kegs.....lb.	...	.35	...	.35	... ...
Malic, powd, kegs.....lb.	.45	.60	.45	.60	.45 .60
Metanilic, 250 lb bbls....lb.	.60	.65	.60	.65	.60 .65
Mixed Sulfuric—Nitric..... tanks wks.....N unit	.06½	.07¼	.06½	.07¼	.06½ .07¼
tanks wks.....S unit	.008	.01	.008	.01	.008 .01
Monochloroacetic, tech bbl.lb.	.16	.18	.16	.18	.16 .18
Monosulfonic, bbls.....lb.	1.50	1.60	1.50	1.60	1.50 1.60
Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	...	1.35	...	1.35	... 1.35
tanks, wks.....100 lb.	...	1.00	...	1.00	... 1.00
20 degrees, cbys wks.100 lb.	...	1.45	...	1.45	... 1.45
N & W.....250 lb bbls.	.85	.95	.85	.95	.85 .95
Naphthenic, drums .....lb.	.12	.13	.10	.13	.10 .11½
Naphthionic, tech.....250 lb.	.60	.65	.60	.65	.60 .65
Nitric, 36 deg, 135 lb cbys c-wks .....100 lb.	...	5.00	...	5.00	... 5.00
40 deg, 135 lb cbys, c-1 wks. .....100 lb.	...	6.00	...	6.00	... 6.00
Oxalic, 300lb bbls wks NY..lb.	.11⅞	.12⅜	.11⅞	.12⅜	.11 .12⅜
Phosphoric 50%, USP....lb.	...	.14	...	.14	... .14
50%, acid, c.l. drums..lb.	.05	.05	.05	.05	.05 .05
75%, acid, c.l. drums..lb.	.07	.07	.07	.07	.07 .07
Picramic, 300 lb bbls....lb.	.65	.70	.65	.70	.65 .70
Picric, kegs.....lb.	.30	.50	.30	.50	.30 .50
Pyrogallic, crystals .....lb.	1.40	1.45	1.40	1.45	1.40 1.45
Salicylic, tech, 125 lb bbl..lb.	.33	.37	.33	.37	.33 .37
Sebacic, tech, drum.....lb.	.58	.58	.58	.58	.58 .58
Sulfanilic, 250 lb. bbls....lb.	.18	.19	.18	.19	.15 .17
Sulfuric, 66 deg, 180 lb. cbys 1c-1 wks.....100 lb.	1.60	1.95	1.60	1.95	1.60 1.95
tanks, wks.....ton	...	15.00	...	15.00	... 15.00
1500 lb dr wks....100 lb.	1.50	1.65	1.50	1.65	1.50 1.65
60°, 1500 lb dr wks..100 lb.	1.27½	1.42½	1.27½	1.42½	127½ 1.42½
Oleum, 20%, 1500 lb. drs 1c-1 wks.....ton	...	18.50	...	18.50	... 18.50
40%, 1c-1 wks net.....ton	...	42.00	...	42.00	... 42.00
Tannic, tech, 300 lb bbls.lb.	.23	.40	.23	.40	.23 .40
Tartaric, USP, gran. powd, 300 lb bbls.....lb.	...	.26	.25	.26	.20 .25
Tobias, 250 lb bbls.....lb.	.75	.80	.75	.80	.75 .80
Trichloroacetic bottles..lb.	2.00	2.75	2.00	2.75	2.00 2.75
Kegs .....lb.	...	1.75	...	1.75	... 1.75
Tungstic, bbls.....lb.	1.35	1.45	1.35	1.70	1.40 1.70
Albumen, blood,225 lb bbls.lb.	.45	.53	.35	.53	.35 .43
dark .....bbls., lb.	.12	.17	.10	.17	.10 .17
Egg, edible .....lb.	.82	.86	.82	.92	.74 .90
Technical, 200 lb cases.lb.	.62	.66	.62	.66	.62 .66
Vegetable, edible.....lb.	.65	.70	.65	.70	.60 .70
Technical .....lb.	.50	.55	.50	.55	.50 .55
Alcohol Butyl, Normal, 50 gal drs c-1 wks.....lb.	...	.10½	...	.10½	... .10½
Drums, 1-c-1 wks.....lb.	...	.11	...	.11	... .11
Tank cars wks.....lb.	...	.09½	...	.09½	... .09½
Secondary tank.....lb.	...	.076	...	.076	... ...
drums carlots .....lb.	...	.086	...	.086	... ...
Amyl (from pentane) Tanks, del.....lb.	...	.143	...	.143	.143 .176
Drums, del.....lb.	.15	.157	.15	.157	... ...
Tertiary, drums, del....lb.	.082	.093	.082	.093	... ...
Tanks, del.....lb.	...	.052	...	.052	... ...
Capryl, tech, drums....lb.	...	.85	...	.85	... .85
Diacetone, tanks.....lb.	.15¾	.16¾	.15¾	.16¾	.15¾ .16¾
Ethyl, USP, 190 pf, 50 gal. bbls .....gal.	...	4.15½	4.12½	4.24½	2.44½ 2.65
No. 5. *188 pf, 50 gal. drs., drums extra†.gal.	...	.347*	.347*	.351*	... .385*
No. S. D. 1, tanks...gal.	...	.295	.29½	.304	... .304
Furfuryl, tech., 500 lb. drs. .....lb.	...	.35	.35	.40	.40 .45
Isobutyl, ref., gal. drs..gal.	...	.75	...	.75	... .75
Isopropyl, ref, gal drs...gal.	...	.50	...	.50	.45 .50
Propyl Normal, 50 gal dr. .....gal.	...	.75	...	.75	... .75
Aldehyde Ammonia, 100 gal. dr. .....lb.	.80	.82	.80	.82	.80 .82
Alpha-Naphthol, crude, 300 lb. bbls. .....lb.	.65	.70	.65	.70	.65 .70
Alpha-Naphthylamine, 350 lb. bbls. .....lb.	.32	.34	.32	.34	.32 .34
Alum Ammonia, lump, 400 lb. bbls, 1-c-1 wks..100 lb.	2.90	3.25	3.00	3.25	3.00 3.25
Chrome, 500 lb casks, wks .....100 lb.	7.00	7.25	6.50	7.25	4.50 6.50
Potash, lump, 400 lb casks wks .....100 lb.	2.90	3.25	3.00	3.50	3.00 3.50
Soda, ground, 400 lb bbls wks .....100 lb.	3.50	3.75	350	3.75	3.50 3.75
Aluminum Metal, c-1 NY .....100 lb.	20.00	23.30	20.00	24.30	22.00 24.30
Chloride Anhyd., 99%, wks .....lb.	.07	.12	.07	.12	... ...
93% grade, wks.....lb.	.04	.08	.04	.08	... ...
Hydrate, 96%, light, 90 lb. bbls. .....lb.	.13	.15	.13	.16½	.15 .16½
Palmitate, bbls.....lb.	.19	.20	.19	.20	... ...
Resinate, pp., bbls.....lb.	.12½	.14	.12½	.14	... ...
Stearate, 100 lb bbls....lb.	.17	.18	.17	.18	.12½ .18
Sulfate, Iron, free, bags c-1 wks .....100 lb.	1.90	1.95	1.90	1.95	1.90 1.95
Coml, bags c-1 wks 100 lb.	1.35	1.50	1.35	1.50	1.25 1.50
Aminoazobenzene, 110 lb kegs .....lb.	...	1.15	...	1.15	... 1.15
Ammonia					
Ammonia anhydrous Com. tks.	.04½	.05½§	.04½	.05½§	.04½ .05½
Ammonia anhyd, 100 lb cyl lb.	.15¼	.15½	.15¼	.15½	.15¼ .15½
Water, 26°, 800 lb dr del..lb.	.02½	.03	.02½	.03	.02½ .03
Ammonia, aqua 26° tanks.. NH cont.....	...	.05	...	.05	... .05
Ammonium Acetate.....lb.	.26	.33	.26	.33	.26 .33
Bicarbonate, bbls., f.o.b. plant .....100 lb.	...	5.15	...	5.15	... 5.15
Bifluoride, 300 lb bbls..lb.	.15¼	.17	.15¼	.17	.15¼ .17
Ammonium carbonate, tech, 500 lb cs.....lb.	.08	.12	.08	.12	.08 .12
Chloride, White, 100 lb. bbls, wks .....100 lb.	5.00	5.25	5.00	5.25	4.45 5.25
Gray, 250 lb bbls wks.lb.	5.25	5.75	5.25	5.75	5.25 5.75
Lump, 500 lbs cks spot.lb.	.10	.11	.10	.11	.10 .11
Lactate, 500 lb bbls.....lb.	.15	.16	.15	.16	.15 .16
Linoleate .....lb.	...	.12	.11	.12	... .11
Nitrate, tech, casks.....lb.	.03¾	.05	.03¾	.05	.03¾ .10
Oleate, drs.....lb.	...	.10	...	.10	... .10
Persulfate, 112 lb kegs..lb.	.20	.22½	.20	.22½	.20 .22½
Phosphate, tech, powd, 325 lb. bbls .....lb.	.08	.10	.08	.11½	.08½ .11½

†Anhydrous 5c higher *Delivered metropolitan area, basic price 33c.
§Higher price is refrigeration grade.
the cost of tax paid ethyl alcohol. Quotation above includes this tax.
Grain alcohol is 20c a gal. higher.

Prices Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Ammonium sulfate, bulk c-l .....100 lb.	...	1.18	1.17	1.25	1.00	1.25
Sulfocyanide, kegs.....lb.	...	.50	...	.50	.36	.50
Amyl Acetate, (from pentane) Tanks del.....lb.	...	.13½	...	.13½	...	.13½
Tech., drs. del.....lb.	.142	.149	.142	.149	.138	.149
Secondary, tanks.....lb.	...	.09	...	.09	...	.09
Amyl Alcohol, see also Fusel Oil						
Amyl Alcohol, sec.....lb.	...	.08½	.08½	.08½	...	...
Chloride, normal, drums, wks. .....lb.	.56	.68	.56	.68	...	...
Chloride, mixed, drums, wks. .....lb.	11.5	12.2	11.5	12.2	...	...
tank wks. .....lb.	...	10.5	...	10.5	...	...
Lactate, wks, drums...lb.	...	.50	...	.50	...	...
Mercaptan, wks, drums.lb.	...	1.10	...	1.10	...	...
Stearate, wks, drums...lb.	...	.31	...	.31	...	...
Amylene, drums, wks. ...lb.	.10	.11	.10	.11	...	...
tanks, wks. .....lb.	...	.09	...	.09	...	...
Aniline Oil, 960 lb drs & tks .....lb.	.15	.17½	.15	.17½	.14½	.16
Annatto fine.....lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80%.....lb.	...	.75	...	.75	...	...
40% .....lb.	...	.18	...	.18	...	...
Anthraquinone, sublimed, 125 lb. bbls. .....lb.	...	.45	...	.45	...	.45
Antimony, metal slabs, ton lots .....lb.	...	.07¾	.07	.08⅞	.05⅝	.07½
Needle, powd., bbls....lb.	.07	.08	.07	.09	.07	.09
Chloride, soln (butter of) cbys .....lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls.....lb.	.08½	.11	.08	.11	.07½	.11
Salt, 63% to 65%, tins..lb.	.22	.24	.22	.24	.20	.24
Sulfuret, golden, bbls...lb.	.16	.20	.16	.20	.16	.20
Vermilion, bbls.....lb.	.35	.42	.35	.42	.38	.42
Archil, conc, 600 lb bbls..lb.	.21	.27	.21	.27	.20	.21
Double, 600 lb bbls....lb.	.18	.20	.18	.20	.16	.17
Triple, 600 lb bbls.....lb.	.18	.20	.18	.20	.16	.17
Argols, 80%, casks.....lb.	.15	.16	.15	.16	.12	.15
Crude, 30%, casks.....lb.	.07	.08	.07	.09	.06¾	.09
Aroclors, wks .....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl.....lb.	.08¾	.09¾	.08¾	.09¼	...	...
Arsenic, Red, 224 lb kegs, cs. .....lb.	.15	.15½	.14	.15½	.09⅜	.14¾
White, 112 lb kegs....lb.	.04	.05	.04	.05	.04	.05
Metal .....lb.	.40	.42.	40	.45	...	...
Asbestine, c-l wks.....ton	13.00	15.00	13.00	15.00	13.00	15.00
Barium Carbonate, precip, 200 lb. bags wks‡ ..ton	56.50	61.00	56.50	61.00	56.50	61.00
Nat. (witherite) 90% gr. car-lots wks bags....ton	...	45.00	...	45.00	...	...
Chlorate, 112 lb kegs NY lb.	.15	.16	.15	.16	.13¾	.16
Chloride, 600 lb bbl wks.ton	72.00	74.00	72.00	74.00	61.50	74.00
Dioxide, 88%, 690 lb drs.lb.	.11	.13	.11	.13	.11	.13
Hydrate, 500 lb bbls....lb.	.05	.06	.04¾	.06	.04¼	.05
Nitrate, 700 lb casks....lb.	...	.08¼	...	.08¼	...	.07¼
Barytes, Floated, 350 lb bbls wks .....ton	23.00	30.50	23.00	30.50	22.20	30.50
Bauxite, bulk, mines....ton	5.00	8.00	5.00	8.00	5.00	6.00
Bayberry, bags .....lb.	.26	.30	.25	.30	.14½	.17
Beeswax, Yel., crude bags.lb.	.21	.22	.16	.22	.13	.20
Refined, cases.....lb.	.26	.29	.21	.29	.18	.26
White, cases.....lb.	.34	.37	.32	.37	.30	.35
Benzaldehyde, technical, 945 lb. drums wks.....lb.	.60	.65	.60	.65	.60	.65
Benzene, 90%, Industrial, 8000 gal tanks wks..gal.	...	.19	.19	.20½	.20	.22
Ind. Pure, tanks wks...gal.	...	.19	.19	.20½	.20	.22
Benzidine Base, dry, 250 lb. bbls. .....lb.	.67	.69	.67	.69	.65	.67
Benzoyl, Chloride, 500 lb drs. .....lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech drs.lb.	...	.30	...	.30	...	.30
Beta-Naphthol, 250 lb bbl wk .....lb.	...	.24	...	.24	...	.24
Naphthylamine, sublimed 200 lb bbls.....lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech. 200 lb bbls.....lb.	.53	.58	.53	.58	.53	.58
Bismuth, metal	...	1.20	1.20	1.30	.85	1.30
Bismuth Subnitrate.....	1.55	1.60	1.40	1.60	.95	1.40
Blackstrap, cane, (see Molasses, Backstrap)						
Blanc Fixe, 400 lb bbls wks .....ton	42.50‡	70.00	42.50‡	70.00	42.50	75.00
Bleaching Powder, 800 lb drs c-l wks contract..100 lb.	...	1.90	...	1.90	1.75	1.90
Blood, Dried, fob, NY..Unit	...	2.40	2.40	3.25	1.55	2.75
Chicago, high grade..Unit	...	2.35	2.00	3.10	...	...
S. American shipt....Unit	...	2.85	2.75	3.15	1.90	3.00
Blues, Bronze Chinese Milori Prussian Soluble.....lb.	.35½	.37½	.35½	.37½	...	.35
Bone, raw, Chicago.....ton	21.00	22.00	20.00	25.00	19.00	28.00
Bone Ash, 100 lb kegs....lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls.....lb.	.05½	.08¼	.05½	.08¼	.05½	.08
Meal, 3% & 50%, Imp..ton	17.00	19.00	16.00	20.00	18.00	27.50
Borax, bags .....lb.	.018	.02	.018	.02	.018	.02
Bordeaux, Mix. 16% pwd..lb.	.08	.16½	.08	.16½	.11½	.13
Brazilwood, sticks, shpmt.lb.	26.00	28.00	26.00	28.00	26.00	28.00
Bromine, cases.....lb.	.36	.43	.36	.43	.36	.43
Bronze, Alumi., pwd blk..lb.	.50	.75	.50	.75	.50	.75
Gold bulk .....lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16.32° group 3 tanks .....lb.	.02¾	.04	.02¾	.04	.02¾	.04
Butyl, Acetate, normal drs.lb.	...	.11	...	.11	.11	.139
Tank, wks.....lb.	...	.10	...	.10	.10	.124
Secondary tanks, wks...lb.	...	.08	...	.08	...	...
Aldehyde, 50 gal drs wks.lb.	.35	.36	.35	.36	.31½	.36
Carbitol see Diethylene Glycol Mono (Butyl Ether).	...	...	...	...	...	...

‡Lowest price is for pulp; highest for high-grade precipitate.

Butyl Carbinol
Cobalt Resinate

Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Butyl carbinol, sec., drms lb.	.60	.60	.70	...	...
Carbinol, normal, drms, wks, ...lb.	.60	.60	.75	...	...
Cellosolve (see Ethylene glycol mono butyl ether)					
Furoate, tech, 50 gal dr.lb.	...	.65	.60	.65	.50	.60
Lactate, drums....lb.	...	.29	...	.29	...	...
Propionate, drs....lb.	.17	.18	.17	.22	.20	.22
Stearate, 50 gal drs....lb.	.25	.25½	.25	.25½	.25	.25
Tartrate, drs....lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes..lb.	.70	.75	.65	.75	.65	.75
Calcium, Acetate, 150 lb bags c-l ....100 lb.	2.50	3.00	2.50	3.00	2.50	3.00
Arsenate, 100 lb bbls c-l wks ....lb.	.05	.05½	.05	.07	.05½	.07
Carbide, drs....lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bags c-l....lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-l wks....ton	...	19.50	...	19.50	19.50	21.00
Solid, 650 lb drs c-l fob wks ....ton	...	17.50	...	17.50	17.50	18.00
Ferrocyanide, 350 lb. f.o.b. wks....lb.	...	.17	...	.17	.17	.17
Calcium Furoate, tech, 100 lb. drums ....lb.	...	.25	.25	.30	...	.30
Nitrate, 100 lb bags....ton	...	26.50	...	26.50	24.00	26.50
Palmitate, bbls....lb.	.19	.20	.19	.20	.16	.19
Perioxide, 100 lb drs....lb.	...	1.25	...	1.25	...	1.25
Phosphate, tech, 450 lb bbls. ....lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip., bbls...lb.	.13	.14	.13	.14	...	...
Stearate, 100 lb. bbls...lb.	.17	.18	.17	.18	.12½	.18
Camphor, slabs ....lb.	.51	.52	.51	.59	.35½	.59
Powder ....lb.	.51	.52	.51	.59	.38	.59
Camwood, Bk, ground bbls.lb.	.16	.18	.16	.18	.16	.18
Candelilla Wax, bags....lb.	.13	.14½	.10¼	.14½	.09	.11
Carbitol, (See Diethylene Glycol Mono Ethyl Ether)..	...	...	...	...	...	...
Carbon, Decolorizing, drums c-l ....lb.	.08	.15	.08	.15	.08	.15
Black, 100-300 lb cases1c-l NY ....lb.	.07	.08¼	.06½	.08¼	.06	.12
Bisulfide, 500 lb drs 1c-l NY ....lb.	.05½	.06	.05½	.06	.05½	.06
Dioxide, Liq. 20-25 lb. cyl. ....lb.	...	.06	...	.06	...	.06
Tetrachloride, 1400 lb drs delivered ....lb.	.05¼	.06	.05¼	.06	.05¼	.07
Carnauba Wax, Flor, bags.lb.	.37	.38	.32	.38	.23	.33
No. 1 Yellow, bags....lb.	.31½	.32½	.30	.36	.20	.35
No. 2 N Country, bags..lb.	Nominal		.20	.23	.14	.20
No. 3 N. C....lb.	.21	.21½	.16¼	.21½	.11½	.17
No. 3 Chalky....lb.	.18	.19½	.16	.21½	.12	.17
Casein, Standard, Domestic ground ....lb.	.12½	.13	.11½	.13	.06½	.15
80-100 mesh c-l, bags....lb.	.13	.14	.12½	.14	...	...
Cellosolve (see Ethylene glycol mono ethyl ether)....						
Acetate (see Ethylene glycol mono ethyl ether acetate)						
Celluloid, Scraps, Ivory cs.lb.	...	.18	.13	.18	.13	.15
Transparent, cases ....lb.	...	.20	.16	.20	...	.16
Cellulose, Acetate, 50 lb kegs ....lb.	.55	.60	.55	.90	.80	.90
Chalk, dropped, 175 lb bbls.lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks.lb.	.03	.04	.03	.04	.02	.03½
Light, 250 lb casks....lb.	.03	.04	.03	.04	.02½	.03½
Charcoal, Hardwood, lump, bulk wks ....bu.	...	.20	.18	.20	.18	.19
Willow, powd, 100 lb bbl. wks ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
Wood, powd, 100 lb. bbls.lb.	.04	.05	.04	.05	.04	.05
Chestnut, clarified bbls wks.lb.	.01⅝	.01¾	.01⅝	.01¾	.01¼	.02
25% tks wks....lb.	...	.01½	.01¼	.01½	.012	.01½
Pwd, 60%, 100 lb. bags wks. ....lb.	...	.04⅞	...	.04⅞	...	.04¾
Powd, decol, bgs wks...lb.	.05	.05¼	.05	.05¼	.04⅞	.05
China Clay, lp, blk mines.ton	8.00	9.00	8.00	9.00	8.00	9.00
Powdered, bbls....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks...ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, bulk..ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls 1c-l wks contract ....lb.	.07	.08½	.07	.08½	.07	.08½
cyls, cl., contract....lb.	...	.05½†	...	.05½†	...	.05½
Liq tank cyls wks contract ....100 lb.	...	1.85	...	1.85	1.75	1.85
Multi c-l cyls, wks cont..lb.	2.00	2.25	2.00	2.25	...	...
Chlorobenzene, Mono, 100 lb. drs 1c-l wks....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs ....lb.	.20	.21	.20	.21	.15	.20
USP, tins....lb.	.30	.31	.30	.35	...	...
Chloropicrin; comml cyls.lb.	.85	.90	.85	1.25	.90	1.35
Chrome, Green, CP....lb.	.20	.30	.20	.30	.28	.29
Commercial ....lb.	.06¼	.10	.06¼	.10	.06¼	.10
Yellow ....lb.	.15	.16	.15	.16	.14	.16
Chromium, Acetate, 8% Chrome bbls ....lb.	.05	.05¾	.05	.05¾	.04¾	.05¾
20° soln, 400 lb. bbls..lb.	...	.05½	...	.05½	...	.05½
Fluoride, powd, 400 lb. bbl. ....lb.	.27	.28	.27	.28	.27	.28
Oxide, green, bbls....lb.	.22	.23	.22	.23	.19	.23
Coal tar, bbls....bbl.	8.50	9.00	8.50	9.00	8.50	9.00
Cobalt Acetate, bbls....lb.	...	.60	.60	.80	...	...
Carbonate tech., bbls...lb.	1.35	1.40	1.34	1.40	...	...
Hydrate, bbls ....lb.	1.66	1.76	1.66	1.76	...	...
Linoleate, paste, bbls....lb.	...	.30	.30	.40	...	...
Resinate, fused, bbls....lb.	...	.12½	...	.12½	...	...
Precipitated, bbls ....lb.	...	.32	.32	.42	.41	.42

Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Cobalt Oxide, black, bags..lb.	1.25	1.25	1.35	1.15	1.35
Cochineal, gray or bk. bg..lb.	.36	.36	.42	.36	.42
Teneriffe silver, bags...lb.	.37	.37	.43	.37	.43
Copper, metal, electrol 100 lb.	...	7.87½	9.00	5.00	9.00
Carbonate, 400 lb bbls..lb.	...	...	.08¼	.07	.08
52-54% bbls.....lb.	.15½	.15½	.16	.15¾	.17¼
Chloride, 250 lb bbls....lb.	.17	.17	.18	.17	.18
Cyanide, 100 lb drs.....lb.	.37	.37	.40	.39	.40
Oleate, precip., bbls.....lb.	...	...	.20	...	...
Oxide, red, 100 lb bbls..lb.	.15	.12½	.17	.14¾	.15
Resinate, precip., bbls..lb.	.18	.18	.19	...	...
Stearate, precip., bbls...lb.	.35	.35	.40	...	...
Sub-acetate verdigris, 400 lb. bbls.....lb.	.18	.18	.19	.18	.19
Sulfate, bbls c-l wks.100 lb.	...	3.75	3.85	3.00	3.75
Copperas, crys and sugar bulk c-l wks bags.....ton	14.00	14.00	14.50	14.00	14.50
Corn Syrup, 42 deg., bbls. .....100 lb.	...	3.04	3.44	2.61	3.04
43 deg., bbls.....100 lb.	...	3.09	3.49	2.66	3.09
Cotton, Soluble, wet, 100 lb. bbls. .....lb.	.40	.40	.42	.40	.42
Cream Tartar, USP, powd., & gran., 300 lb. bbls..lb.	.19¼	.17½	.19½	.14½	.17¾
Creosote, USP., 42 lb cbys lb.	.45	.45	.47	.40	.47
Oil, Grade 1 tanks...gal.	.11	.11	.12	.11	.12
Grade 2.....gal.	.10	.10	.12	.10	.12
Grade 3.....gal.	.09	.09	.12	.09	.12
Cresol, USP. drums....lb.	...	.11	...	.11	.10½ .11
Crotonaldehyde, 98% 50 gal. dr. .....lb.*	.26	.26	.30	.32	.36
Cudbear, English .....lb.	.19	.19	.25	.16	.25
Cutch, Rangoon, 100 lb. bales .....lb.	...	...	.02¾	.02½	.03
Borneo, Solid, 100 lb. bale .....lb.	...	...	.04½	.02½	.04½
Philippine, 100 lb bale .lb.	.03½	.03½	.04¾	...	...
Cyanamid, bags c-l frt allowed Ammonia unit..	...	1.07½	1.07½	.97½	1.07½
Dextrin, corn, 140 lb bags ..... 100 lb.	3.50	3.50	3.70	2.89	3.84
British Gum, bags.100 lb.	3.75	3.75	3.95	3.89	3.92
White, 140 lb bags 100 lb	3.45	3.47	3.67	2.94	3.79
Potato Yellow, 220 lb bgs .....lb.	.07¾	.07¾	.08¾	.07¾	.09
White, 220 lb bags 1c-l lb	.08	.08	.09	.08	.09
Tapioca, 200 bags 1c-l.lb.	.06¾	.06¾	.07¾	.06¾	.08
Diamylamine, drums, wks.lb.	...	...	1.00	...	...
Diamylene, drums, wks..lb.	.09	.09	.10	...	...
tanks, wks .....lb.	...	...	.08½	...	...
Diamylether, wks., drums lb.	.60	.60	.77	...	...
Diamylphthalate, drs wks.gal.	...	...	.20½	...	...
Diamyl Sulfide, drms, wks.lb.	...	...	1.10	...	...
Dianisidine, barrels .....lb.	2.35	2.35	2.45	2.35	2.70
Dibutylphthalate, wks ...lb.	.20½	.20½	.21	.20½	.22
Dibutyltartrate, 50 gal drs lb.	.29½	.29½	.31½	.29½	.21
Dichlorethylene, drums...gal.	.29	.29	...	...	...
Dichloroethylether, 50 gal drs. .....lb.	...	...	.21	.16	.21
Dichloromethane, drs wks.lb.	...	...	.15	...	...
tanks, wks .....lb.	...	...	.02½	...	...
Dichloropentanes, drums, wks. .....lb.	.0278	.0278	.036	...	...
tanks, wks.....lb.	...	...	.02½	...	...
Diethyamine, 400 lb drs ..lb.	2.75	2.75	3.00	2.75	3.00
Diethyl Carbinol, drums..lb.	.60	.60	.75	...	...
Diethylcarbonate, com. drs lb.	...	...	.35	...	...
90% grade, drs.....lb.	...	...	.25	...	...
Diethylaniline, 850 lb drs lb.	.52	.52	.55	.52	.55
Diethyleneglycol, drs ....lb.	.14	.14	.16	.14	.16
Mono ethyl ether, drs.lb.	.15	.15	.16	.15	.16
Mono butyl ether, drs.lb.	...	...	.26	...	.26
Diethylene oxide, 50 gal drs ..... lb.	.26	.26	.27	.26	.27
Diethylorthotoluidin, drs..lb.	.64	.64	.67	.64	.67
Diethyl phthalate, 1000 lb. drums .....lb.	.26	.26	.27	.20	.26
Diethysulfate, technical, 50 gal drums .....lb.	...	...	...	...	...
Diglycol Oleate, bbls.....lb.	...	...	.16	...	...
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis .....lb.	...	...	1.20	...	...
Dimethylaniline, 340 lb drs lb.	.29	.29	.30	.25	.28
Dimethyl Ethyl Carbinol, drs. .....lb.	.60	.60	.70	...	...
Dimethyl phthalate drs...lb.	...	...	.24½	...	...
Dimethysulfate, 100 lb drs lb.	.45	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	.17	.19½z	.17	.19½z	... .18
Dintrochlorobenzene, 400 lb bbls .....lb.	.14½	.15½	.14½	.15½	.13 .15
Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.34	.37	.34 .37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23 .24
Dinitrotoluene, 300 lb bbls lb.	.15½	.16½.	15½	.16½	.15 .17
Dioxan (See Diethylene Oxide)	...	...	...	...	... ...
Diphenyl .....lb.	.15	.25	.15	.25	.15 .40
Diphenylamine .....lb.	.31	.34	.31	.34	.31 .34
Diphenylguanidine, 100 lb bbl ..... lb.	.36	.37	.36	.37	.30 .37
Dip Oil, 25%, drums.....lb.	.23	.25	.23	.25	.23 .25
Divi Divi pods, bgs shipmt .....ton	...	40.00	35.00	40.00	26.00 36.00
Extract .....lb.	.05	.05½	.05	.05½	.05 .05½
Egg Yolk, 200 lb cases.. lb.	.42½	.47	.40	.47	.40 .43
Epsom Salt, tech, 300 lb bbls c-l NY .....100 lb.	...	2.25	2.20	2.25	... 2.20
Ether, USP anaesthesia 55 lb drs .....lb.	.22	.23	.22	.24	.22 .24
(Conc) .....lb.	.09	.10	.09	.10	.09 .10

‡Higher price refined. xTanks 2c lower. zHigher price for purified.

Ether, Isopropyl, Gum Copal Congo — Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Ether Isopropyl 50 gal. drums ..... lb.	.07‡x	.08	.07‡x	.08	.07	.08
Synthetic, wks, drums..lb.	.08	.09	.08	.09	...	...
Ethyl Acetate, 85% Ester tanks .....lb.	.07½	.08	.07½	.08	.07½	.09
drums .....lb.	.08½	.09	.08½	.09	.08½	.10
Anhydrous, tanks .....lb.	.09	.10	.09	.10	.09	.10
drums .....lb.	.10	.10¼	.10	.10¼	.10	.10¼
Acetoacetate, 50 gal drs lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drums..lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drums..lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate cbys...lb.	...	.30	...	.30	...	.30
Crotonate, drums.....lb.	1.00	1.25	1.00	1.25	...	...
Ether, Absolute, 50 gal drs .....lb.	.50	.52	.50	.52	.50	.52
Lactate, drums works..lb.	.25	.29	.25	.33	.25	.29
Methyl Ketone, 50 gal drs ..... lb.	.08½	.09	.08½	.09	...	.12½
Oxalate, drums works.lb.	.37½	55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks .....lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb dr .....lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont.....lb.	.75	.85	.75	.85	.75	.85
Dichloride, 50 gal drums lb.	.06	.09	.05½	.09	.05	.09
Glycol, 50 gal drs wks lb.	.26	.28	.26	.28	.25	.28
Mono Butyl Ether drs wks	...	.20	...	.20	...	.20
Mono Ethyl Ether drs wks	.16	.17	.15	.17	.15	.17
Mono Ethyl Ether Acetate dr wks.....	17½	.18	.16½	.18	.16½	.18
Mono Methyl Ether, drs ..... lb.	.21	.23	.21	.23	.21	.23
Stearate	.18	.18	.18	.18	.18	.18
Oxide, cyl.....lb.	...	.75	...	.75	...	.75
Ethylidenaniline .....lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, bulk pottery...ton	...	14.50	...	14.50	14.00	16.50
Powdered, bulk works.ton	13.50	14.50	13.50	14.50	13.50	14.50
Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.05	.07½	.05	.07½	.04½	.07½
Fish Scrap, dried, wks...unit	...	2.50*	...	2.50*	1.85	2.75*
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis ..... unit	...	2.50‡	...	2.50‡	1.85‡	2.50‡
Fluorspar, 98%, bags.....ton	28.00	35.50	28.00	35.50	28.00	35.50
Formaldehyde, aniline, 100 lb. drums .....lb.	.37½	.42	.37½	.42	.37½	.42
USP, 400 lb bbls wks.lb.	.06	.07	.06	.07	.06	.07
Fossil Flour .....lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, bulk, mines ..... ton	15.00	20.00	15.00	20.00	15.00	20.00
Imp. powd c-l bags...ton	24.00	30.00	23.00	30.00	24.00	30.00
Furfural (tech.) drums wks ..... lb.	.10§	.15	.10§	.15	.10	.15
Furfuramide (tech) 100 lb dr ..... lb.	...	.30	...	.30	...	.30
Furfuryl Acetate, 1 lb tins lb.	...	5.00	...	5.00	...	5.00
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.14½	.18
Fustic, chips .....lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb. boxes..lb.	.20	.23	.20	.23	.18	.23
Liquid 50°, 600 lb. bbls.lb.	.08½	.12	.08½	.12	.07	.10
Solid, 50 lb. boxes.....lb.	.16	.18	.16	.18	.14	.18
Sticks .....ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls.lb.	.42	.43	.42	.43	.42	.43
Gall Extract .....lb.	.18	.20	.18	.20	.18	.20
Gambier, com. 200 lb. cs...lb.	.04½	.05½	.04	.05½	.03	.07
Singapore cubes, 150 lb. bg. ..... 100 lb.	.05½	.06	.05	.07	.05¼	.08
Gelatin, tech, 100 lb cases.lb.	.45	.50	.45	.50	.45	.50
Glauber's Salt, tech, c-l wks. .....100 lb.	1.10	1.30	1.10	1.30	1.00	1.70
Glucose (grape sugar) dry 70-80° bags c-l NY.100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb. bags .....100 lb.	...	2.33	...	2.33	...	2.33
Glue, bone, com. grades, c-l bags .....lb.	.08	.12½	.08	.12½	...	...
Better grades, c-l, bags.lb.	.12½	.16	.12½	.16	...	...
Casein, kegs .....lb.	.18	.22	.18	.22	...	...
Hide, high grd, c-l, bags.lb.	.23	.28	.23	.28	...	...
Med. grd, c-l, bags..lb.	.19	.23	.19	.23	...	...
Low grade, c-l, bags..lb.	.13½	.19	.13½	.19	...	...
Glycerin, CP, 550 lb drs..lb.	.13½	.14	.11	.14	.10¼	.11
Dynamite, 100 lb drs...lb.	.13	.13½	.10	.13½	.07½	.10¼
Saponification, tanks ...lb.	.10	.10⅛	.06¾	.10⅛	.05	.08
Soap Lye, tanks.....lb.	.09	.09⅛	.06¼	.09⅛	.04	.06½
Glyceryl Stearate, bbls.....lb.	...	.18	...	.18	.17	.18
Graphite, Crystalline, 500 lb bbls..lb.	.04	.05	.04	.05	.04	.05
Flake, 500 lb. bbls.....lb.	.08	.16	.08	.16	.08	.16
Amorphous, bbls. .....lb.	.03	.04	.03	.04	.03	.04
GUMS						
Gum Aloes, Barbadoes....lb.	.87	.90	.85	.90	.85	.90
Animi (Zanzibar) bean & pea, 250 lb. cases.....lb.	.35	.40	.35	.40	.35	.40
Glassy, 250 lb cases.....lb.	.50	.55	.50	.55	.50	.55
Arabic, amber sorts.....lb.	.08⅞	.09½	.07¾	.09½	.05¾	.08¼
Asphaltum, Barbadoes (Manjak) 200 lb bags.....lb.	.03	.04	.03	.06	.03	.05
Egyptian, 200 lb cases..lb.	.12	.15	.12	.15	.13	.15
Benzoin Sumatra, U.S.P. 120 lb. cases .....lb.	.21	.23	.21	.23	.17	.23
Copal Congo, 112 lb. bags, clean, opaque† .....lb.	.24⅛	.24⅝	.24⅛	.28	.16½	.28
Dark, amber† .....lb.	.08¾	.09¼	.08⅝	.10½	.06	.10½
Light, amber† .....lb.	.14⅝	.14⅞	.14⅜	.19	.08	.19

† Carlot (min. 30,000 lbs.) prices apply to assorted lots as well as carlot quantities ot a single grade.
* & 10; ‡ & 50. § Tanks, lc lower.

Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Copal Congo water, white† lb.	.41⅝	.42⅛	.41⅝	.48	.37	.48
Damar Batavia standard 136, lb. cases† ..... lb.	.13¼	.13¾	.12⅞	.13¾	.08½	.15½
Batavia Dust, 160 lb bags† lb.	.05¾	.06¼	.05¾	.07	.04	.07½
E Seeds, 136 lb cases† .. lb.	.07½	.08	.07½	.09½	.05½	.09½
F Splinters, 136 lb cases and bags ..... lb.	.06⅛	.06⅝	.05½	.06⅝	.05½	.06
Singapore,						
No. 1, 224 lb cases† .... lb.	.15½	.16	.15½	.18	.09½	.18
No. 2, 224 lb cases† .... lb.	.09⅜	.09⅞	.09⅜	.11	.07	.11½
No. 3, 180 lb bags† .... lb.	.05½	.06	.05⅛	.07	.04½	.07½
Ester, light ..... lb.	.06¾	.07½	.06	.07½	...	...
Copal Manila 180-190 lb. baskets						
Loba A† ..... lb.	.11⅜	.11⅞	.11⅜	.14½	.09	.13½
Loba B† ..... lb.	.11	.11½	.11	.13½	.08	.13
Loba C† ..... lb.	.09¾	.10¼	.09¾	.12	.07	.12
M A Sorts† ..... lb.	.06¾	.07¼	.06½	.07½	.05	.07
D B B Chips† ..... lb.	.08	.08½	.08	.09½	.05¾	.09½
Copal East Indies chips, 180 lb. bags† ..... lb.	.04	.04½	.04	.05	.04	.07
Pale bold, 224 lb cs† .. lb.	...	.17	.16	.17	.05½	.17
Pale nubs, 180 lb bags† lb.	.10½	.10¾	.10½	.13	.05	.13
Copal Pontianak, 224 lb cases						
Bold gen No. 1† .... lb.	.17⅝	.18½	.17½	.19	.14	.18½
Gen. chips spot† ..... lb.	.07⅝	.08⅛	.07¼	.08¼	.05	.08
Elemi, No. 1, 80-85 lb cs.. lb.	.09⅛	.09⅝	.09¾	.11½	.09	.12½
No. 2, 80-85 lb cases.. lb.	.09¼	.09½	.09¼	.11¾	.08½	.12
No. 3, 80-85 lb cases.. lb.	.08	.08½	.08	.08½	.08	.08½
Gamboge, pipe, cases..... lb.	.60	.65	.57	.65	.42	.65
Powdered, bbls ..... lb.	.70	.75	.67	.75	.50	.70
Ghatti, sol. bags..... lb.	.09	.09½	.09	.09½	.06	.09½
Karaya, pow. bbls xxx.... lb.	.23	.25	.23	.25	...	...
xx ..... lb.	.15	.16	.15	.16	...	...
No. 1 ..... lb.	.10	.11	.10	.11	...	...
No. 2 ..... lb.	.07	.08	.07	.09	...	...
Kauri, 224-226 lb cs No. 1† lb.	.19	.19½	.19	.25	.20	.25
No. 2 fair pale† ..... lb.	.14½	.15	.12½	.16	.12½	.16
Brown Chips, 224-226 lb. cases† ..... lb.	.06½	.08½	.06½	.08½	.06½	.12
Bush Chips, 224-226 lb. cases† ..... lb.	.22	.22½	.22	.24	.22	.24
Pale Chips, 224-226 lb. cases† ..... lb.	.11½	.14	.11	.14	.11	.14
Kino, tins ..... lb.	.75	.80	.75	.80	...	...
Mastic† ..... lb.	.50	.50½	.35	.50½	.26⅞	.40
Sandarac, prime quality, 200 lb bags & 300 lb casks. lb.	.48	.48½	.44	.50	.21	.50
Senegal, picked bags..... lb.	.17	.18	.17	.18	...	...
Sorts ..... lb.	.08⅜	.09	.08	.09	...	...
Thus, bbls. .....280 lbs.	...	10.50	9.50	10.50	...	...
Strained .....280 lbs.	...	10.75	9.50	10.75	...	...
Tragacanth, No. 1 bags.... lb.	1.05	1.15	1.00	1.20	.65	1.00
Yacca, bags ..... lb.	.03¼	.03¾	.03¼	.04	...	...
Hematine crystals, 400 lb bbls. ..... lb.	.16	.18	.16	.18	.10	.18
Paste, 500 bbls..... lb.	...	.11	...	.11	...	.11
Hemlock 25%, 600 lb. bbls. wks. ..... lb.	.03½	.04½	.03½	.04½	.03½	.04½
Bark ..... ton	...	16.00	...	16.00	...	16.00
Hexalene, 50 gal drs wks.. lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70°C. Group 3, tanks..... gal.	...	.14	...	.14	...	...
Hexamethylenetetramine, drums ..... lb.	.37	.39	.37	.39	...	...
Hoof Meal, fob Chicago. unit	1.80	2.00	1.85	2.60	.75	1.75
South Amer. to arrive. unit	...	1.85	1.65	1.80	1.40	1.75
Hydrogen Peroxide, 100 vol, 140 lb cbys..... lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride ..... lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls. lb.	.17	.20	.17	.20	.11	.20
Indigo Madras, bbls..... lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drums..... lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid ..... lb.	...	.12	...	.12	...	.12
Iodine, crude .....per kilo	...	15s 1d	...	15s 1d	...	...
Resublimed, kegs ..... lb.	2.25	2.30	2.25	2.30	2.10	3.40
Irish Moss, ord. bales.... lb.	.07	.08	.07	.08	...	...
Bleached, prime, bales.. lb.	.14	.15	.14	.15	...	...
Iron Acetate Liq. 17°, bbls. lb.‡	.03	.04	.03	.04	...	...
Iron Chloride see Ferric or Ferrous						
Nitrate, kegs ..... lb.	.09	.10	.09	.10	.09	.10
Coml, bbls. .....100 lb.	2.75	3.25	2.75	3.25	2.50	3.25
Oxide, English..... lb.	.08¾	.09	.08¾	.09	.04	.07
Isobutyl Carbinol (128-132°C) drums, wks..... lb.	...	.329	.34	.329	...	.34
tanks, whks, lb..... lb.	...	.326	...	.326	...	...
Isopropyl Acetate, tanks... lb.	...	.07½	.07	.07½	...	...
Japan Wax, 224 lb cases.. lb.	.06½	.06¾	.06	.08	.05½	.08
Keiselguhr, 95 lb. bgs. N.Y. Brown ..... ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate, bbls wks. 100 lb.	...	9.50	...	9.50	8.50	9.50
White crystals, 500 lb bbls wks ..... 100 lb.	...	10.50	...	10.50	9.50	10.50
Arsenate, drs cl-lcl, wks. lb.	.09	.10½	.07	.18	.09	.10½
Linoleate, solid bbls..... lb.	.26	.26½	.26	.26½	...	...
Metal, c-l NY .....100 lb.	...	3.75	3.75	4.25	3.00	4.50
Nitrate, 500 lb bbls wks. lb.	.10	.14	.10	.14	.10	.14
Oleate, bbls. ..... lb.	.15	.16	.15	.16	.15	.16
Lead Oxide Litharge, 500 lb. bbls. ..... lb.	.05¼	.06¼	.05¼	.06¾	.05½	.07
Red, 500 lb bbls wks.. lb.	.06¼	.07¼	.06¼	.07¾	.06½	.08
Resinate, precip., bbls.. lb.	...	.14	.14	18½	...	...
Stearate, bbls ..... lb.	.22	.23	.22	.23	...	...
White, 500lb bbls wks. lb.	.06½	.07	.06½	.07	.06	.07
Sulfate, 500lb bbls wks. lb.	...	.06	...	.06	.05½	.06
Lime, ground stone bags. ton	...	9.25	4.50	9.25	...	4.50
Lime Salts, see Calcium Salts						
Lime-Sulfur soln bbls.... gal.	.14	.33	.14	.33	.15	.17
Linseed cake, bulk..... ton	20.50	23.00	20.50	27.00	17.50	27.50

‡Higher price for lcl quantities.

† Carlot (min. 30,000 lbs.) prices apply to assorted lots as well as carlot quantities of a single grade.

Gum Copal Congo Linseed Cake

Linseed Meal
Orange-Mineral

Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Linseed Meal .....ton	30.50	31.00	30.50	37.00	28.00	37.00
Lithopone, 400 lb bbls lcl wks .....lb.	.04¾	.05	.04¾	.05	.04¾	.05
Logwood, 51°, 600 lb bbls..lb.	.08½	.12½	.08½	.12½	.05	.12½
Solid, 50 lb boxes.....lb.	.14½	.17½	.14½	17½	.08	.17½
Sticks .....ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch .....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl..ton	60.00	65.00	55.00	65.00	46.00	65.00
Magnesium Carb, tech, 70 lb. bags NY .....lb.	...	.06½	...	.06½	.05¾	.06½
Chloride flake, 375 lb drs c-l wks .....ton	36.00	39.00	34.00	39.00	34.00	36.00
Imported shipment ...ton	31.75	33.00	31.75	33.00	31.75	33.00
Fused, imp., 900 lb bbls NY ..... ton	...	31.00	...	31.00	...	31.00
Magnesium Fluosilicate, crys, 400 lb bbls, wks.....lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb. bbls .....lb.	...	.42	...	.42	...	.42
Heavy, 250 lb bbls....lb.	...	.50	...	.50	...	.50
Palmitate, bbls .....lb.	.21	.22	.21	.22	...	...
Linoleate, lig. drums....lb.	.18	.19	.18	.19	...	...
Resinate, fused, bbls....lb.	.08¼	.08½	.08¼	.08½	...	...
precip., bbls. .....lb.	...	.12	.11½	.12½	...	...
Sulfate, Anhyd., 550 lb drs N Y .....lb.	.09	.09½	.08	.09½	.07	.08
Manganese Borate, 30%, 200 lb. bbls. .....lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb casks..lb.	.07	.08	.07	.08	.07	.08
Dioxide, tech (peroxide) drs ..... lb.	.03¾	.06	.03¾	.06	.03½	.06
Mangrove 55%,400 lb bbls.lb.	...	.04	...	.04	...	.04
Bark, African .....ton	26.00	27.00	26.00	31.00	22.00	31.00
Marble Flour, bulk.....ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercuric chloride .....lb.	.88	.93	.82	.93	.67	.87
Mercury metal ....76 lb. flask	74.50	77.00	66.50	79.00	48.00	69.00
Meta-nitro-aniline .....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-para-oluidine 200 lb. bbls .....lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb bbls .....lb.	.80	.84	.80	.84	.80	.84
Peroxide, 100 lb cs.....lb.	1.20	1.25	1.20	1.25	1.00	1.25
Silicofluoride, bbls .....lb.	.09	.10	.09	.11	.08¾	11.
Stearate, bbls .....lb.	.19	.20	.19	.20	.16½	.20
Meta-toluene-diamine, 300 lb. bbls .....lb.	.67	.69	.67	.69	.67	.69
Methanol (Wood Alcohol)						
*Crude, tanks .....gal.	...	.25	...	.25	.20	.20
95% tanks .....gal.	.33	.35	.33	.35	.33	.35
97% tanks .....gal.	.34	.39	.34	.39	.34	.39
*Pure, Synthetic drs cars.gal.	...	.40	...	.40	.37½	.40
*Synthetic, tanks .....gal.	...	.35½	...	.35½	...	.35½
*Denat. grade, tanks....gal.	...	.43	.40	.43	.35	.40
Methyl Acetate drs 82%.gal.	.12	.13	.12	.13	.12	.13
99% tanks .....gal.	...	.15	...	.15	...	.15
Acetone, drums .....gal.	.53½	.56	.53½	.57	.42	.57
Hexyl Ketone, pure...lb.	...	1.20	...	1.20	...	1.20
Anthrapuinone .....lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tanks....lb.	...	.10½	.10½	.10½	...	...
Cellosolve (See Ethylene Glycol Mono Methyl Ether)						
Chloride, 90 lb cyl.....lb.	.45	.45	.45	.45	.45	.45
Ethyl Ketone, tanks.....lb.	...	.07½	.07½	.07½	...	...
Mica, dry grd. bags wks..lb.	65.00	80.00	65.00	80.00	65.00	80.00
Michler's Ketone, kegs....lb.	...	2.50	...	2.50	2.50	3.00
Molasses, blackstrap, tanks f.o.b. N. Y. .....gal.	.06	.06⅛	.06	.09	.04½	.07
Monoamylamine, drs, wks..lb.	...	1.00	...	1.00	...	...
Monochlorobenzene, drums, see Chlorobenzene, mono.						
Monomethylparaminosulfate, 100 lb drums.....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Montan Wax, crude, bags..lb.	.10½	.11	.10	.11	.03¾	.10
Myrobalans 20%, liq bbls..lb.	.03¾	.04¼	.03¾	.04¼	.03¼	.04¼
50% Solid, 50 lb boxes..lb.	.06	.06¼	.06	.06¼	.05	.06¼
J1 bags .....ton	...	26.00	26.00	32.00	27.00	35.00
J2 bags .....ton	16.25	16.50	16.25	18.00	15.00	22.00
R2 bags .....ton	16.00	16.50	16.25	18.00	15.00	22.00
Naphtha, v.m. & p. (deodorized) tanks, Group 3 tanks .....gal.	.06¼	.06⅞	.06¼	.07¼	...	...
Bayonne, tanks.....lb.	...	.09½	...	.09½	.08½	.09½
Naphthalene balls, 250 lb bbls wks. .....lb.	.06	.07	.06	.07	.05½	.07
Crude, imp .....100 lb.	1.15	1.90	1.75	2.15	1.75	2.15
Crushed, chip. bgs wks..lb.	...	.05	...	.05	...	.05
Flakes, 175 lb bbls wks.lb.	...	.07¼	...	.07¼	...	.07¼
Nickel Chloride, bbls.....lb.	.18	.19	.18	.19	.17	.19
Oxide, 100 lb kegs NY..lb.	.35	.37	.35	.37	.35	.37
Salt bbl 400 bbls lb NY.lb.	.11½	.12	.11½	.12	.11	.13
Single, 400 lb bbls NY.lb.	.11½	.12	.11½	.12	.11	.12
Metal ingot.....lb.	.35	.35	.35	.35	.35	.35
Nicotine, free 40%, 8 lb tins, cases	8.25	10.15	8.25	10.15	...	...
Sulfate, 55 lb. drums...lb.	.67	.75	.67	.75	.67	.75
Nitre Cake, blk.....ton	12.00	14.00	12.00	14.00	10.00	14.00
Nitrobenzene, redistilled, 1000 lb. drs wks‡.....lb.	.08½	.11	.08½	.11	.08½	.11
Nitrocellulose, c-l-l-cl, wks.lb.	.27	.33	.27	.33	.27	.33
Nitrogenous Mat'l., bulk.unit	...	2.40	2.40	3.25	1.50	3.50
Nitronaphthalene, 550 lb bbls. .....lb.	.24	.25	.24	.25	.24	.25
Nutgalls Aleppy, bags....lb.	...	.18	...	.18	...	.18
Chinese, bags.....lb.	.17	.18	.17	.18	.17	.18
Oak Bark, ground.....ton	30.00	35.00	30.00	35.00	30.00	35.00
Whole .....ton	20.00	23.00	20.00	23.00	20.00	23.00
Extract, 25% tan., bbls..lb.	.03⅜	.03½	.03⅜	.03½	...	...
Orange-Mineral, 1100 lb casks NY ..... lb.	.09¼	.10	.09¼	.10½	.09½	.10¾

* Delivered basis (east of Miss. River).
‡ Higher price is for lcl quantities.

Current

Orthoaminophenol
Phosphorous Oxychloride

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Orthoaminophenol, 50 lb kgs. ....lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs.lb.	1.00	1.15	1.00	1.15	1.00	1.15
Orthochlorophenol, drums.lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drums.....lb.	.13	.15	.13	.15	.13	.15
Orthodichlorobenzene, 1000 lb. drums .....lb.	.05½	.06	.05½	.06	.05½	.06
Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	.28	.29	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs wk .....lb.	.05½	.06	.05½	.06	.05½	.06
Orthonitrophenol, 350 lb dr. ....lb.	.52	.80	.52	.80	.52	.90
Orthotoluidine, 350 lb bbl l-c-l .....lb.	.14	.15	.14	.15	.14	.22
Orthonitroparachlorphenol, tins .....lb.	.70	.75	.70	.75	.70	.75
Osage Orange, crystals...lb.	.16	.17	.16	.17	.16	.17
51 deg. liquid.....lb.	.07	.07¾	.07	.07¾	.06	.07¾
Powdered, 100 lb bags..lb.	.14½	.15	.14½	.15	.14½	.15
Paraffin, refd, 200 lb cs slabs						
123-127 deg. M. P.....lb.	.047	.04¾	.04½	.04¾	.02	.04½
128-132 deg. M. P.....lb.	.04¾	.0515	.04¾	.0515	.03⅛	.04¾
133-137 deg. M. P.....lb.	.0575	.07	.05	.07	.043	.05¾
Para Aldehyde, 110-55 gal. drs. .....lb.*	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb. bg. .....lb.	.52	.60	.52	.60	.52	.60
Aminohydrochloride, 100 lb. kegs .....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs.lb.	.78	.80	.78	.80	.78	.80
Chlorophenol, drums....lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drs..lb.	...	...	...	...	...	...
Cymene, refd, 110 gal dr. .....gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene, 150 lb bbls wks.....lb.	.16	.20	.16	.20	.15	.18
Nitroacetanilid, 300 lb. bbls .....lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls wks .....lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb. drs. wks.....lb.	.23½	.24	.23½	.24	.23½	.26
Nitro-orthotoluidine, 300 lb. bbls .....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol 185 lb bbls.lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 120 lb. bbls.....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls.lb.	.35	.37	.35	.37	.29	.37
Phenylenedamine, 350 lb bbls. .....lb.	1.25	1.30	1.25	1.30	1.15	1.30
Para Tertiary amyl phenol wks, drums .....lb.	...	.50	...	.50	...	...
Toluenesulfonamide, 175 lb bbls. .....lb.	.70	.75	.70	.75	.70	.75
Toluenesulfonchloride, 410 lb bbls wks.....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls wk .....lb.	.56	.60	.56	.60	.56	.60
Paris Green, Arsenic Basis						
100 lb kegs.....lb.	...	.23	...	.23	...	.24
250 lb kegs.....lb.	...	.22	...	.22	...	.23
Perchlorethylene, 50 gal dr.lb.	...	.15	...	.15	...	...
Persian Berry Ext, bbls..lb.	.25	Nom.	.25	Nom.	.25	Nom.
Pentane, normal, 28-38° C, group 3, tanks.....gal.	...	.09	...	.09	...	...
Pentasol (see Alcohol, Amyl)						
Pentasol Acetate (see Amyl Acetate)						
Petrolatum, Green, 300 lb. bbl. .....lb.	.01⅞	.02	.01⅞	.02	.01⅞	.02
Petroleum Ethers, tks. 30-60°, Group 3.....gal.	...	.13	.11	.13	.10	.11
Petroleum solvents and diluents						
Cleaners' naphtha, Group 3, tanks .....gal.	.06¼	.06½	.06¼	.07⅜	.05	.07¾
Lacquer diluents, Bayonne, tanks .....gal.	.12	.12½	.12	.12½	.12	.12¾
Group 3, tanks....gal.	.07⅞	.08	.06⅞	.08⅜	.06¼	.08⅛
Petroleum thinner 47-49° tanks, Group 3.....gal.	.05⅞	.06⅜	.05⅞	.06⅜	...	...
Rubber solvent, stand. grade tanks, Group 3.gal.	.06⅜	.06⅞	.06⅜	.06⅞	.05	.06⅞
East Coast tanks....gal.	...	.09½	...	.09½	.09	.09½
Stoddard solvents 48-50 deg. tanks, Group 3.....gal.	.05¾	.06⅜	.05¾	.07⅛	.04½	.06⅜
East Coast tanks....gal.	...	.09½	...	.09½	.09	.09½
Phenol, 250-100 lb drums.lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kegs.....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drums..lb.	...	.16	...	.16	...	...
Phenylhydrazine Hydrochloride .....lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phosphate Acid (see Superphosphate)						
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis .....ton	...	3.25	2.85	3.25	2.75	3.25
70% basis .....ton	...	3.75	3.35	3.75	3.25	3.90
72% basis .....ton	...	4.25	3.85	4.25	3.75	4.35
75-74% basis .....ton	...	5.25	4.90	5.30	4.75	5.50
75% basis .....ton	...	5.35	5.05	5.40	4.85	5.75
77-80% basis .....ton	...	6.25	5.90	6.25	5.75	6.30
Tennessee, 72% basis..ton	...	4.75	4.75	5.00	...	5.00
Phosphorous Oxychloride 175 lb. cyl.....lb.	.16	.20	.16	.20	.16	.23
Red, 110 lb cases.....lb.	.44	.45	.44	.45	.40	.45
Yellow, 110 lb cs wks.lb.	.28	.33	.28	.33	.27½	.33

* Higher price is for lcl quantities.

Phosphorous Oxychloride
Satin, White

Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Phosphorous Sesquisulfide, 100 lb cs .....lb.	.38	.44	.38	.44	.38	.44
Trichloride, cylinders...lb.	.16	.20	.16	.20	.16	.23
Phthalic Anhydride, 100 lb wks .....lb.	.14½	.15	.14½	.15	.13½	.16
Pigments Metallic, Red or or brown bags, bbls, Pa. wks .....ton	37.00	45.00	37.00	45.00	37.00	45.00
Pine Oil, 55 gal drs or bbls. Destructive dist.....lb.	.59	.62	.59	.62	.59	.62
Steam dist. wat. wh. bbls. .....gal.	.64	.65	.64	.65	...	...
Prime bbls.....bbl.	8.00	10.60	8.00	10.60	8.00	10.60
Pitch Hardwood, wks....ton	...	20.00	...	20.00	20.00	25.00
Plaster Paris, tech, 250 lb. bbls. .....bbl.	3.40	3.50	3.40	3.50	3.30	3.50
Platinum, Refined .....oz.	35.00	36.00	35.00	38.00	24.00	38.00
Pontol, tanks .....per gal.	...	.54	...	.54	...	.54
Potash, Caustic, wks, sol.lb.	.07⅛	.07⅜	.07⅛	.07⅜	.06⅛	.07⅜
flake .....lb.	.0803	.08¼	.0803	.08¼	.0705	.08¼
Liquid tanks .....lb.	...	.03⅝	...	.03⅝	...	...
Potash Salts, Rough Kainit 12.4% basis bulk.....ton	...	nom.	...	9.20	...	9.20
14% basis .....ton	...	nom.	...	9.70	...	9.70
Manure Salts..... 20% basis bulk.....ton	...	12.00	...	12.00	...	12.00
30% basis bulk.....ton	...	19.15	...	19.15	...	19.15
Potassium Acetate.....lb.	.27	.28	.27	.28	.27	.28
Potassium Muriate, 80% basis bags .....ton	...	nom.	...	37.15	...	37.15
Pot. & Mag. Sulfate, 48% basis bags .....ton	...	nom.	22.50	25.00	25.00	27.80
Potassium Sulfate, 90% basis bags .....ton	...	nom.	35.00	42.15	42.15	47.50
Potassium Bicarbonate, USP, 320 lb bbls.....lb.	.07½	.09	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb casks .....lb.	.08⅛	.08⅝	.08⅛	.08⅝	.07¼	.08⅝
Binoxalate, 300 lb bbls.lb.	.22	.23	.14	.23	.14	.17
Bisulfate, 100 lb kegs..lb.	.16	.30	.16	.30	.16	.30
Carbonate, 80-85% calc 800 lb casks.....lb.	.07	.07½	.07	.07½	.04⅞	.07½
Chlorate crystals, powd. 112 lb keg wks.....lb.	...	.09	.08½	.09	.08	.09
Chloride, crys. bbls.....lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kegs.....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb. cases..lb.	.55	.60	.55	.60	.50	.60
Iodide, 75 lb. bbls.....lb.	1.65	1.70	1.65	2.70	2.35	2.70
Metabisulfite, 300 lb bbl.lb.	.10½	.11	.10½	.11	.10½	.11
Oxalate, bbls.....lb.	.16	.24	.16	.24	.16	.24
Perchlorate, cask wks...lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys. 500 & 1000 lb drs wks lb.	.18½	.19½	.18½	.19½	.17½	.19½
Prussiate, red, 112 lb kg.lb.	.39	.41	.35	.39	.39	.41
Yellow, 500 lb casks..lb.	.18	.19	.18	.19	.16½	.19
Tartrate Neut, 100 lb kg.lb.	...	.21	...	.21	...	.21
Titanium Oxalate, 200 lb bbls. .....lb.	.32	.35	.32	.35	...	...
Propane, group 3, tanks.....	...	.07	...	.07	...	.07
Pumice Stone, lump bags.lb.	.04½	.06	.04½	.06	.04	.06
250 lb bbls.....lb.	.05	.07	.05	.07	.04½	.07
Powdered, 350 lb bags..lb.	.02½	.03	.02½	.03	.02½	.03
Putty, commL, tubs...100 lb.	...	2.25	...	2.25	2.00	2.25
Linseed Oil, kegs...100 lb.	4.00	4.50	4.00	4.50	3.40	4.50
Pyridine, 50 gal drums...gal.	...	1.25	...	1.25	.85	1.25
Pyrites, Spanish cif Atlantic ports bulk.....unit	.12	.13	.12	.13	.12	.13
Quebracho, 35% liq. tks...lb.	...	.02⅜	.02¼	.02⅜	.02	.02⅜
450 lb bbls c-l.....lb.	...	.02⅞	.02¾	.02⅞	.02⅜	.02⅞
Solid, 63%, 100 lb bales cif .....lb.	...	.02⅞	.02⅞	.03⅜	.02⅜	.03⅜
Clarified, 64%, bales..lb.	...	.03	.03	.03½	.02⅜	.03½
Quercitron, 51 deg liquid 450 lb. bbls.....lb.	.06	.06½	.05½	.06½	.05½	.06
Solid, 100 lb boxes.....lb.	.10	.12	.09½	.13	.09½	.13
Bark, Rough.....ton	...	14.00	...	14.00	...	14.00
Ground .....ton	34.00	35.00	34.00	35.00	34.00	35.00
R Salt, 250 lb bbls wks...lb.	.40	.44	.40	.44	.40	.44
Red Sanders Wood, grd bbls. .....lb.	...	.18	...	.18	...	.18
Resorcinol Tech, cans.....lb.	.65	.75	.65	.75	.65	.70
Rochelle Salt, cryst.....lb.	.15½	.16	.12½	.16	...	...
Rosin Oil, 50 gal bbls, first run .....gal.	...	.48	.45	.48	.42	.46
Second run.....gal.	...	.53	.50	.53	.46	.51
FF Wood Rosin, c.l. NY..	...	5.20	5.20	6.13	...	...
Rosins 600 lb bbls 280 lb..unit ex. yard N. Y.						
B	...	5.35	4.50	5.75	2.75	5.15
D	...	5.35	4.60	5.85	2.95	5.15
E	...	5.35	4.80	6.50	3.55	5.15
F	...	5.45	5.00	6.75	3.85	5.17½
G	...	5.47½	5.05	6.75	3.90	5.17½
H	...	5.52½	5.10	6.75	4.00	5.17½
I	...	5.55	5.15	6.75	4.05	5.20
K	...	5.55	5.30	6.75	4.60	5.20
M	...	5.65	5.50	6.80	4.35	5.25
N	...	5.70	5.50	6.80	4.75	5.40
WG	...	5.75	5.95	6.80	4.80	5.60
WW	...	5.90	6.50	6.85	4.85	6.20
Rotten Stone, bags mines.ton	23.50	24.00	23.50	24.00	23.50	24.00
Lump, imported, bbls...lb.	.05	.07	.05	.07	.05	.07
Selected bbls.....lb.	.09	.12	.09	.12	.09	.12
Powdered, bbls.....lb.	.02½	.05	.02½	.05	.02	.05
Sago Flour, 150 lb bags..lb.	.02½	.03	.02½	.03	.02½	.03
Sal Soda, bbls wks...100 lb.	1.10	1.10	1.10	1.10	.90	1.10
Salt Cake,94-96% c-l wks. ton	13.00	18.00	13.00	18.00	13.00	18.00
Chrome .....ton	12.00	13.00	12.00	13.00	12.00	13.00
Saltpetre, double refd granular 450-500 lb bbls...lb.	...	.06	...	.06	.05¾	.06¾
Satin, White, 550 lb bbls..lb.	...	.01½	...	.01½	...	.01½

* Higher price is for lcl quantities.

Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Shellac Bone dry bbls†...lb.	.32	.26	.37	.18	.28
Garnet, bags† .....lb.	.30	.24	.31	.15	.20
Superfine, bags‡ .....lb.	.28	.23	.31	.09½	.18¾
T. N. bags‡ .....lb.	.26				
Schaeffer's Salt kegs.....lb.	.48	.48	.50	.48	.50
Silica, Crude, bulk mines.ton	8.00	8.00	11.00	8.00	11.00
Refined, floated bags...ton	22.00	22.00	30.00	22.00	30.00
Air floated bags.....ton	...	...	32.00	...	32.00
Extra floated bags...ton	30.00	30.00	35.00	30.00	35.00
Silver Nitrate, vials.....oz.	...	.31⅜	.35⅜	...	...
Soapstone, Powdered, bags f.o.b. mines.....ton	15.00	15.00	22.00	15.00	22.00
Soda Ash, 58% dense, bags c-l wks.....100 lb.	...	...	1.25	1.17½	1.25
58% light, bags....100 lb.	...	...	1.25	1.17½	1.23
Soda Caustic, 76% grnd & flake drums.....100 lb.	...	...	3.00	2.90	3.00
76% solid drs.....100 lb.	...	...	2.60	2.50	2.60
Liquid sellers tanks, 100 bls.	...	...	2.25	2.15	2.25
Sodium Abietate, drs.....lb.	...	.03	.08	...	.03
Acetate, tech 450 lb. bbls wks .....lb.	.04½	.04½	.05	.04¼	.05
Alignate, drs.....lb.	...	...	.50	...	.50
Aresenate, drums.....lb.	.07¾	.07¾	.08¾	.07¾	.08¾
Arsenite, drums.....gal.	.40	.40	.75	.05	.75
Benzoate U.S.P., kegs..lb.	.45	.45	.47	...	...
Bicarb, 400 lb bbl...100 lb.	...	...	2.25	...	2.25
Bichromate, 500 lb cks wks. .....lb.	.06⅛	.06⅛	.06⅛	.044	.07
Bisulfite, 500 lb bbl wks.lb.	.03	.03	.0335	.023¼	.0335
Chlorate, wks.....lb.	.06¼	.06¼	.07½	.05¾	.07¾
Chloride, technical.....ton	13.60	11.40	16.50	11.40	14.00
Cyanide, 96-98%, 100 & 250 lb. drums wks.....lb.	.15½	.15½	.16½	.15½	.16
Fluoride, 300 lb bbls wks .....lb.	.07½	.07½	.09½	.07	.07½
Hydrosulfite, 200 lb bbls f.o.b wks.....lb.	.19½	.19½	.21	.20	.21
Hypochloride solution, 100 lb. cbys. .....lb.	...	...	.05	...	.05
Hyposulfite, tech, pea crys 375 lb bbls wks..100lb.	2.40	2.40	3.00	2.40	3.00
Technical, regular cryst. 375 lb bbls wks.100 lb.	2.40	2.40	2.65	2.40	2.65
Iodide, ...lb.	2.75	2.75	3.50	3.10	3.50
Metanilate, 150 lb bbls..lb.	.41	.41	.42	.44	.45
Metasilicate, c-l, wks.100 lb.	2.65	2.65	3.05	2.65	3.25
Monohydrate, bbls.....lb.	...	...	.02½	...	.02½
Naphthionate, 300 lb bbl.lb.	.52	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb. bags c-l NY...100 lb.	...	...	1.31½	1.26	1.31½
100 lb. bags .....ton	...	...	27.00	...	...
Bulk .....ton	...	...	24.50	...	...
Nitrite, 500 lb bbls spot.lb.	.07¼	.07¼	.08	.07¼	.08
Orthochlorotoluene, sulfonate, 175 lb bbls wks.lb.	.25	.25	.27	.25	.27
Perborate, 275 lb bbls..lb.	.18	.18	.19	.17	.19
Peroxide, bbls. 400 lb...lb.	...	...	.17	...	...
Phosphate, di-sodium, tech. 310 lb bbls.....100 lb.	...	2.10	2.40	2.00	2.40
tri-sodium, tech, 325 lb bbls. .....100 lb.	...	2.60	2.70	2.15	2.50
Picramate, 160 lb kegs..lb.	.69	.69	.72	.69	.72
Prussiate, Yellow, 350 lb bbl. wks.....lb.	.11½	.11½	.12	.11½	.12
Pyrophosphate,100 lb kg.lb.	.16½	.16½	.18	.15	.20
Silicate, 60 deg 55 gal drs, wks. .....100 lb.	1.65	1.65	1.70	1.65	1.70
40 deg 55 gal drs. wks .....100 lb.	...	...	.80*	.75	.80
Silicofluoride, 450 lb bbls NY .....lb.	.05	.04¾	.06	.04½	.06
Stannate, 100 lb. drums lb.	.33½	.33½	.36½	.18	.37
Stearate, bbls.....lb.	.20	.20	.25	.20	.25
Sulfanilate, 400 lb. bbls..lb.	.16	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-l wks.....lb.	.022	.022	.0285	.02	.0285
Sulfide, 80% crystals, 440 lb bbls wks.....lb.	...	.02¼	.02½	.02½	.02¾
62% solid, 650 lb drums c-l wks.....lb.	...	...	.03	...	.03
Sulfite, crystals, 400 lb bbls wks .....lb.	.02¼	.02¼	.02½	.03	.03¼
Sulfocyanide, bbls.....lb.	.28	.28	.35	.28	.35
Tungstate, tech, crystals, kegs .....lb.	.83	.70	.88	.57	.67
Spermaceti, blocks, cases..lb.	.18½	.18	.20	.17	.22
Cakes, cases .....lb.	.19½	.19	.21	.18	.23
Spruce Extract, ord., tks..lb.	...	...	.01	.00⅞	.01
Ordinary, bbls.....lb.	...	...	.01½	.01¼	.01½
Super spruce ext, tks....lb.	...	...	.01⅜	.01¼	.01⅝
Super spruce ext., bbls..lb.	...	...	.01⅞	.01⅝	.01⅞
Super spruce ext, powd., bags .....lb.	...	...	.04	...	.04
Starch, powd, 140 lb bags .....100 lb.	3.01	2.81	3.21	2.29	3.01
Pearl, 140 lb bags...100 lb.	2.91	2.71	3.01	2.19	2.91
Potato, 200 lb bags.....lb.	.05¼	.05¼	.06	.03¾	.06
Imported bags .....lb.	.06	.06	.06½	.04¾	.06½
Starch, Potato Soluble....lb.	.08	.08	.08½	.08	.08½
Rice, 200 lb bbls.....lb.	.07½	.07½	.08½	.07	.08½
Wheat, thick bags.....lb.	.06¼	.06¼	.06¾	.05¾	.06¾
Thin bags.....lb.	.10	.10	.10¼	.09½	.10¼
Strontium carbonate, 600 lb. bbls wks.....lb.	.07¼	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls NY.lb.	.10½	.10½	.11	.07	.11
Peroxide, 100 lb drs....lb.	...	...	1.25	...	1.25
Sulfur Brimstone, bkn. rock, 250 lb bag c-l....100 lb.	...	...	2.05	...	2.05

* Tanks, 15c less; † Bone dry and refined shellac prices at Chicago, 1c higher; Boston, ½c; Pacific Coast, 3c; Philadelphia deliveries, fob. N. Y. City. ‡ T. N. and superfine prices quoted fob. N. Y. City and Boston; Chicago prices, 1c higher; Philadelphia deliveries, fob. N. Y. City.

Sulfur Brimstone
Zinc Cyanide

Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Sulfur ...	.27	.20	.29	.08½	.17¾
Crude, f.o.b. mines....ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour for dusting 99½%, 100 lb bgs c-l NY 100 lb.	...	2.40	...	2.40	...	2.40
Heavy bags c-l...100 lb.	...	2.50	...	2.50	...	2.50
Flowers, 100%, 155 lb bbls c-l NY.....100 lb.	...	3.45	...	3.45	...	3.45
Roll, bbls l-c-l NY..100 lb.	2.65	2.85	2.65	2.85	2.65	2.85
Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb. drs wks..lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl..lb.	.07	.08	.07	.08	.07	.08
Extra, dry, 100 lb cyl..lb.	.11	.13	.11	.13	.10	.13
Sulfuryl Chloride.....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, ground..ton	69.00	71.00	69.00	75.00	50.00	75.00
Talc, Crude, 100 lb bags NY .....ton	12.00	15.00	12.00	15.00	12.00	15.00
Refined, 100 lb bags NY .....ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bags NY.ton	27.50	30.00	27.50	30.00	18.00	30.00
Refined, white, bags ..ton	45.00	60.00	45.00	60.00	35.00	60.00
Italian, 220 lb bags to arr. .....ton	70.00	75.00	70.00	75.00	48.50	75.00
Refined, white bags NY .....ton	75.00	80.00	75.00	80.00	50.00	80.00
Superphosphate, 16% bulk, wks .....ton	...	8.50	8.00	8.50	6.50	8.00
Run of pile.....ton	...	8.00	7.50	8.00	6.00	7.50
Tankage Ground NY...unit	...	2.65*	2.50	2.75*	1.70	2.75*
Unground .....unit	...	2.10*	2.10*	2.35*	2.35*	2.60*
Fert. grade f.o.b. Chicago .....unit	...	2.60*	1.80	2.40*	1.40	3.00
South American cif...unit	...	2.75*	2.75	3.10*	...	2.50
Tapioca Flour, high grade bgs. .....lb.	.03	.05	.03	.05	.03	.05
Medium grade, bgs.. lb.	.03	.04	.03	.04	.03	.04
Tar Acid Oil, 15%, drs..gal.	.21	.22	.21	.22	.20	.22
25% drums.....gal.	.23	.24	.23	.24	.22	.24
Tartar Emetic, Tech.....gal.	...	.22¾	.23	.23	...	...
U. S. P. .....gal.	.28	.28½	.27	.28½	...	...
Terra Alba Amer. No. 1, bgs or bbls mills...100 lb.	1.15	1.75	1.15	1.75	1.15	1.75
No. 2 bgs or bbls..100 lb.	1.00	1.25	1.00	1.25	1.00	1.25
Imported bags.....lb.	.01⅛	.01¼	.01⅛	.01¼	.01⅛	.01¼
Tetrachlorethane, 50 gal dr lb.	.08½	.09	.08½	.09	.08½	.09
Tetralene, 50 gal drs wks ..lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl.lb.	.20	.25	.20	.25	.25	.28½
Tin						
Crystals, 500 lb bbls wks lb.	...	.39	.30	.04½	.24	.41
Metal Straights NY....lb.	...	.51⅛	.50⅞	.55⅜	.23	.57
Oxide, 300 lb bbls wks.lb.	.54	.56	.55	.60	.27½	.59
Tetrachloride, 100 lb drs wks .....lb.	.26½	.27½	.25½	.28½	.126	.28
Titanium Dioxide 300 lb. bbl. .....lb.	.17¼	.19¼	.17¼	.19¼	.17¼	.19¼
Calcium Pigment, bbls...lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Toluene, 110 gal drs.....gal.	...	.35	...	.35	...	.35
8000 gal tk cars wks..gal.	...	.30	...	.30	...	.30
Toluidine, 350 lb bbls....lb.	.88	.89	.88	.89	.88	.89
Mixed, 900 lb drs wks..lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls...lb.	.75	.80	.75	.85	.80	.95
Para, red, bbls.....lb.	...	.75	.75	.80	...	.80
Toluidine .....lb.	...	1.35	...	1.35	1.35	1.55
Triacetin, 50 gal drs wks.lb.	.32	.36	.32	.36	.32	.36
Triamyl Borate, drs, wks.lb.	...	.40	...	.40	...	...
Triamylamine, drs, wks..lb.	...	1.00	...	1.00	...	...
Trichlorethylene, 50 gal dr.lb.	.09½	.10	.09½	.10	.09½	.10
Triethanolamine, 50 gal drs .....lb.	.35	.38	.35	.38	.35	.38
Tricresyl Phosphate, drs..lb.	.19	.26	.19	.26	.19	.26
Triphenyl guanidine.....lb.	.58	.60	.58	.60	.58	.60
Phosphate, drums.....lb.	.37	.39	.37	.39	.37	.39
Tripoli, 500 lb bbls..100 lb.	.75	2.00	.75	2.00	.75	2.00
Tungsten, Wolframite..... .....per unit	15.00	15.25	12.00	15.25	10.00	12.50
Turpentine carlots, N Y dock bbls. .....gal.	...	.49	.47¾	.63½	.46¼	.51½
Savannah, bbls. .....gal.	...	.44	.42¾	.58½	...	...
Jacksonville, bbls.....gal.	...	.43½	.43	.58½	...	...
Wood Steam dist, bbls, c-l N. Y. .....gal.	...	.44	.44	.61	.42	.48
Urea, pure, 112 lb cases..lb.	.15	.17	.15	.17	.15	.17
Fert. grade, bags c.i.f..ton	100.00	120.00	90.00	120.00	82.60	90.00
c.i.f. S. points.....ton	100.00	120.00	90.00	120.00	82.60	90.00
Urea Ammonia liq 55% NH_3, tanks .....unit	...	.96	...	.96	...	...
Valonia beard, 42%, tannin bags .....ton	...	39.50	39.00	40.00	27.50	42.00
Cups, 30-31% tannin...ton	23.50	24.50	23.00	27.00	17.00	25.00
Mixture, bark, bags...ton	...	28.00	...	28.00	22.00	28.00
Vermillion, English, kegs.lb.	1.60	1.73	1.41	1.73	1.05	1.42
Vinyl Chloride, 16 lb cyl.lb.	...	1.00	...	1.00	...	1.00
Wattle Bark, bags.....ton	30.00	32.00	30.00	34.00	24.00	32.00
Extract 55%, tks, bbls.lb.	...	.03¾	.03⅝	.03⅞	.03	.03⅞
Whiting, 200 lb bags, c-l wks .....100 lb.	.85	1.00	.85	1.00	.85	1.00
Alba, bags c-l NY....ton	...	15.00	...	15.00	13.00	15.00
Gliders, bags c-l NY.100 lb.	...	1.35	...	1.35	...	1.35
Wood Flour, c-l.....bags	18.00†	30.00	18.00†	30.00	18.00	36.00
Xylene, 10 deg tks wks.gal.	...	.29	...	.29	.29	.29
Commercial, tks wks..gal.	...	.26	...	.26	...	.26
Xylidine, crude.....lb.	.36	.37	.36	.37	.36	.37
Zinc Ammonium Chloride powd., 400 lb bbls...lb.	.04¾	.05	.04¾	.05	.04¾	.05
Carbonate Tech., bbls NY .....lb.	.09½	.11	.09½	.11	.09½	.11
Chloride Fused, 600 lb drs wks. .....lb.	.04¼	.05	.04¼	.05	.05	.05¾
Gran, 500 lb bbls wks..lb.	...	.05⅛	.05⅛	.06	.05⅜	.06
Soln 50%, tks wks..100 lb.	...	2.00	...	2.00	...	3.00
Cyanide, 100 lb drums..lb.	.36	.41	.36	.41	.38	.39

* &10. † Depends upon grade.

Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Zinc Dust, 500 lb bbls c-l wks					
lb.	...	.0640	.0630	.071	.043¼	.07½
Metal, high grade slabs c-l N Y 100 lb.	...	4.70	4.65	4.87	3.02	5.37
Oxide, Amer., bags wks. lb.	.05¼	.06¼	.05¾	.06¼	.05	.06
French, 300lb bbls wks. lb.	.05¾	.11⅛	.05¾	.11⅛	.05¾	.11⅛
Palmitate, bbls lb.	.20	.21	.20	.21	.17½	.21
Perborate, 100 lb drs. lb.	...	1.25	...	1.25	...	1.25
Peroxide, 100 lb drs. lb.	...	1.25	...	1.25	...	1.25
Resinate, fused, dark, bbls. lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Stearate, 50 lb bbls. lb.	.18	.19	.18	.19	.15	.19
Sulfate, crystals, 400 lb bbl wks lb.	.028	.033	.02¾	.033	.03	.03½
Flake, bbls lb.	.032	.037	...	...	...	...
Sulfide, 500 lb bbls. lb.	.13	.13½	.13	.13½	.12	.13½
Sulfocarbolate, 100 lb keg. lb.	.21	.22	.21	.22	.21	.22
Zirconium Oxide, Nat.kegs. lb.	.02½	.03	.02½	.03	.02½	.03
Pure kegs lb.	.45	.50	.45	.50	.45	.50
Semi-refined kegs lb.	.08	.10	.08	.10	.08	.10
Oils and Fats						
Castor, No. 1, 400 lb bbls. lb.	...	.09¾	...	.09¾	.09¼	.10
No. 3, 400 lb bbls. lb.	...	.09¾	...	.09¾	.08½	.09¾
Blown, 400 lb bbls. lb.	.11½	.12¼	.11½	.12¾	.11¼	.12¾
China Wood, bbls spot NY. lb.	.09	.09⅛	.07½	.09½	.04⅞	.09⅛
Tanks, spot NY. lb.	.087	.089	.07¼	.089	.04¼	.08½
Coast, tanks lb.	.08⅜	.08½	.06⅞	.08½	.04⅛	.08⅛
Coconut, edible, bbls NY. lb.	...	.05⅛	.05⅛	.10¾	...	.10¾
Manila, bbls NY. lb.	...	.03½	.03⅝	.04	.03⅞	.04¾
Tanks, N Y lb.	...	.02½	.02⅝	.03	.02¾	.03¾
Tanks, Pacific Coast. lb.	...	.02¼	.02¼	.02⅞	.02½	.03⅜
Cod, Newfoundland, 50 gal. bbls gal.	.48	Nom.	.34	.40	.19	.35
Copra, bags, N Y. lb.	.012	.0125	.012	.016	.0152½	.019
Corn, crude, bbls NY. lb.	.06⅛	.06¼	.04⅝	.06¼	.04⅜	.07¾
Tanks, mills lb.	.05⅛	.05¼	.03½	.05¼	.02⅞	.06½
Refined, 375 lb bbls NY. lb.	.07⅛	.07¼	.05¾	.07¼	.05¾	.08¾
Degras, American, 50 gal bbls NY lb.	.02¾	.03	.02¾	.03	.02½	.03
English, brown, bbls NY. lb.	.04¼	.04½	.03¾	.04	.02⅞	.04
Greases, Yellow lb.	.03⅜	.03⅝	.02⅜	.03¼	.01¾	.03⅝
White, choice bbls NY. lb.	.03⅝	.04⅜	.02¾	.03⅞	.02½	.04⅜
Herring, Coast, tanks. gal.	.17	Nom.	.15	.15	.11	.23
Lard Oil, edible, prime. lb.	...	.09¾	...	.09¾	.08½	.10½
Extra, bbls lb.	...	.08	.07¾	.08	.07½	.08¼
Extra No. 1, bbls. lb.	...	.07¾	.07½	.07¾	.06	.08
Linseed, Raw, less than 5 bbl. lots lb.	...	.103	.101	.105	.08	.12
Bbls c-l spot lb.	...	.099	.093	.101	.072	.11
Tanks lb.	...	.093	.087	.095	.066	.104
Menhaden, Tanks, Baltimore gal.	...	.20	.15	.20	.09	.15
Refined, alkali bbl. lb.	.057	.061	.057	.069	...	...
Tanks lb.	...	.051	.051	.061	...	...
Light Pressed, bbls. lb.	.051	.055	.051	.057	...	...
Tanks lb.	...	.045	.045	.049	...	...
Neatsfoot, CT, 20° bbls NY. lb.	...	.16½	...	.16½	.11¾	.16¾
Extra, bbls NY lb.	...	.08	.07¾	.08	.06½	.08¼
Pure, bbls NY lb.	...	.12	.12	.13	.07¾	.14
Oleo, No. 1, bbls NY. lb.	...	.06	.06	.06½	.05	.06⅞
No. 2, bbls NY lb.	...	.05½	.05⅜	.05⅞	.04¼	.06⅜
Olive, denat, bbls NY. gal.	.85	.86	.76	.90	.47	.80
Edible, bbls NY gal.	1.75	1.90	1.60	1.90	1.30	1.85
Foots, bbls NY lb.	.07⅛	.07⅜	.06½	.07⅜	.04⅜	.06¾
Palm, Kernel, casks. lb.	.03¼	Nom.	.03¼	04¼	.04	.04¾
Lagos, 1500 lb casks. lb.	...	.03⅞	.03⅝	.03⅞	.02⅝	.04¾
Niger, casks lb.	.03¼	.03⅜	.03¼	.03¾	.024	.04½
Peanut, crude, bbls NY. lb.	...	.08¼	.06½	.08¼	.03½	.07
Refined, bbls NY. lb.	.09½	.10	.07½	.10½	.07½	.11
Perilla, bbls NY lb.	.09½	.09⅝	.08½	.09⅝	.05	.10½
Tanks, Coast lb.	...	.09	.07½	.09	.03¾	.09¾
Poppyseed, bbls NY. gal.	1.50	1.60	1.45	1.60	1.45	1.70
Rapeseed, blown, bbls NY. gal.	.08	.082	.08	.082	...	...
Denatured, drms, NY. gal.	.37	.38	.37	.44	.34	.65
Red, Distilled, bbls. lb.	.06⅞	.07⅝	.06⅞	.07⅝	.05⅞	.07⅝
Tanks lb.	...	.06	...	.06	.05	.06
Salmon, Coast, 8000 gal tks gal.	...	Nom.	.15	.17	.11	.18
Sardine, Pac. Coast tks. gal.	...	.20	.13	.25	.09½	.20
Sesame, edible, yellow,dom. lb.	.08½	.09	.07½	.09	.08½	.10
White, dos lb.	.08½	.09	.08	.09½	.10	.11
Soy Bean, crude Pacific Coast lb.	...	Nom.	...	Nom.	.032	.035
Domestic tanks, f.o.b. mills lb.	...	.06½	.06	.06½	.027	.085
Crude, bbls NY lb.	.071	.075	.066	.071	.04	.095
Refined, bbls NY lb.	.076	.087	.071	.087	.04½	.106
Sperm, 38° CT, bleached, bbls N Y lb.	.108	.11	.108	.11	...	...
45° CT, bleached, bbls NY lb.	.101	.103	.101	.103	...	...
Stearic Acid, double pressed dist bags lb.	.09	.10	.09	.10	.07½	.10
Double pressed saponified bags lb.	.09	.10	.09	.10	.08	.10
Triple pressed dist bags. lb.	.11¾	.12¾	.11¾	.12¾	.10¼	.12¾
Stearine, Oleo, bbls. lb.	.05¼	.06	.05	.05⅞	.03½	.06¾
Tallow City, extra loose. lb.	...	.03¾	.02⅞	.03¾	.02	.03⅞
Edible, tierces lb.	...	.04¾	.04¾	.04⅞	.03½	.05⅛
Tallow Oil, bbls, c-l NY. lb.	.05¾	.06	.05¾	.06	.05¾	.06
Acidless, tanks NY. lb.	...	.07	.06¾	.07	.05	.07
Vegetable, Coast mats lb.	.07¼	Nom.	.06	.07¼	.04¼	.06
Turkey Red, single, bbls. lb.	.07½	...	.07½	...	.06¼	.07½
Double, bbls lb.	.12½	.13	.12½	.13	.08	.13
Whale						
Winter bljch, bbls, NY. lb.	...	.072	...	.072	...	...
Refined, nat, bbls, NY. lb.	.068	.07	.068	.07	...	...

Zinc Dust
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Index to Advertisers

"We"—Editorially Speaking

It's a long, long time since we had to write a news heading "Chemical Company Moves Downtown." Is the AAC going to set a new style in office location?

And speaking of styles, Carleton Ellis has certainly produced the Anthony Adverse of technical literature. Here's hoping it's just as good a "best seller."

For our own particular pet "I-told-you-so Department," we submit the following from an editorial in CHEMICAL INDUSTRIES exactly one year ago: "It (NRA) certainly authorizes a Leninian control of industry backed with ample powers. Contrariwise, it provides for the virtual annulment of the anti-trust laws. The two are incompatible, but it is pretty plain in which direction the present administration is steering, and we have plenty of reason to be suspicious of the principle of legal control over economic forces and of the bureaucratic practice of that control. Small wonder that this bold experiment injects tremendous uncertainties into the present business situation. In fact, the only certainty is, that our Government under Mr. Roosevelt will continue to make dramatic economic experiments."

Up to May 31 of this year the Drug Institute has spent $153,860 for organization, legal publicity, and code expenses, not counting man hours consumed in conference.

George I. Cooper and "We" apologize to the National Association of Glue Manufacturers for having used in the article "Glue" (CHEMICAL INDUSTRIES, February, 1934) liberal abstracts of description and specifications taken without proper credit to their copyrighted booklet "The Story of Animal Glue".

Sometime ago an anonymous letter writer raked us from stem to stern for having said that "the New Deal is fast becoming a raw deal for industry." How we wish he would write us again—to tell us all about the President's order breaking all codes by allowing fifteen per cent. cuts on bids on Government contracts: said cuts to be successive if desired, and said cut prices to be available to all consumers.

And Franklin D. Roosevelt called the NRA a partnership between Government and Business.

And Senator Wagner hailed NRA as the Magna Charta of living wages and fair competition.

And Hugh Johnson once promised that NRA would drive the blood-sucking chiseler out of American business.

Well, well—we are beginning to wonder if "Ballyhoo" was not right, after all, when it said NRA is Nerts, Raspberries, and Applesauce.

Did you know that Orlando F. Weber's son and heir wants to become a biologist and that he spent his Bermuda vacation last Easter collecting rare fishes?

If the President really wants to go in for drouth relief in a practical way, he should send the New York Dutch Treat Club out on a golf tour through the stricken areas. They've had six different golf meetings at three different courses and each time it rained like sixty.

A subscriber of ten years' standing makes our face very red by writing: "You are achieving the impossible in your paper. I read, if possible, every word of it, including the advertisements. Some of these articles (like those on sulfur) are as exciting reading as any fiction I ever read."

One beneficent "Uncle Sam" reached to his ear June 1 for a stubby pencil and after a terrific struggle found himself in red ink to the tune of $27,005,438,-125.73. Remember way back when we used to refer to "telephone numbers?" What pikers we were! If it is any consolation to you, the 27 odd billion debt is some 3 billion below Mr. Roosevelt's prediction.

Whatever Prof. Tugwell may think he is, the country knows, after his word-swallowing act before the Senate Nominating Committee, that he has not the courage of his convictions to become a Stalin.

Carolina banker C. G. Rowland makes a hobby out of cotton growing experimentation, and reports from Sumter, S. C., that he has evolved a pure-strain 5-lock boll about 85-90% perfect; that his yield is 25% more lint than the conventional 4-lock under identical conditions. Is Senator Bankhead in the house?

Mr. Concannon's review on the world's fertilizer supplies was an address delivered before the annual meeting of the National Fertilizer Association at White Sulphur Springs.

Fifteen Years Ago

From our issues of July, 1919

Monsanto (now housed in Empire State Building) files plans for occupancy of four story building at 12 Platt Street, New York.

U. S. Alkali Export Association, Inc., organized. Eli Winkler elected president.

Plant of Union Dye and Chemical Co. at Kingsport, Tenn. closed and production halted, pending settlement with Government for heavy chemicals delivered during the war.

Orlando T. Weber, president, National Aniline, appoints Robert T. Baldwin as assistant to the president.

Refined camphor prices advancing due to Japanese control of monopoly.

H. J. Baker & Bro., of New York, establish branch office at San Francisco.

Scarcity of potash suggests necessity of license system.

Coming Next Month

"Chemicals from Brine" the story of the new chemical operations of the Ozark and Texaco Companies in Oklahoma—final instalment of Mr. Haynes' series of "A Chemical Tourist through the South."

"Petroleum Refining By Means of Selective Solvents"—a description of the technique of this new growing process by S.W. Ferris, of the Atlantic Refining Company.

"Candelilla Wax" — suggestions for its wider use in formulating chemical specialties, by Dr. C. W. Mason.